

# THE ART OF FISHCURING

BY

"VIKING."

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By "VIKING."

(*R. J. DUTHIE, FISHERY OFFICER, LERWICK.*)

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## PREFACE.

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THE favourable reception accorded to the contents of this book on their publication serially in the "Fish Trades Gazette" has encouraged the author to issue them in more permanent form.

He does so in the hope that they may be useful in some degree as a text-book for those engaged in the fishcuring industry; and he is glad to avail himself of this opportunity of gratefully acknowledging the valuable help received from friends skilled in branches of the work which fall outside the limits of his personal experience.



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# The Art of Fishcuring.

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## CHAPTER I.

### HERRING CURING IN PICKLE: OCCASIONAL BARRELS.

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THIS first chapter is intended solely for the guidance of small fishmongers and dealers who may have had no previous experience of herring curing, but who, in the course of business, may have an outlet for a few barrels of pickled herrings.

In the inland wholesale markets, and at the smaller fishing ports, the price of fresh herrings is usually too high to permit the small dealer to cure profitably, but chances of cheap fish are sure to come to him who waits. It is wise, therefore, to keep a few good barrels in stock—whole barrels, half barrels, firkins, or kits, according to trade requirements—as well as sufficient salt for the purpose, so as to be ready to take advantage of the chance when it comes. If the operator is a novice to the trade and has no skilled workers available, he had better be content with one, or at most two, barrels at first; or, even better, he might commence by curing small balances left over from the counter trade, provided the fish have not been kept until they have become soft or stale. In the latter case, however, he should select a barrel or kit which the herrings on hand are likely to fill; remnants packed into the same barrel on successive days do not make a good cure.

A back shop may be utilised for the curing of an occasional kit or barrel of herrings, but if a dozen or a score of barrels be aimed at, a good-sized cellar or a small back-yard will be required. A supply of water is, of course, essential, and a hard floor is best to work upon and easiest to keep clean. The orthodox “farland” or receiving-box can scarcely be looked for in the premises under consideration; but the herrings should first be lightly sprinkled or “roused” with salt, and this may be done either by

spreading out the herrings on a cellar floor, throwing salt over them, and turning them over with a wooden shovel, or by emptying them slowly from one vessel into another and throwing on salt all the time. "Rousing" on a floor is to be preferred, however, as the work can be most thoroughly done in this way.

If the barrels have not already been prepared, the curer should now "unhead" as many as he is likely to require, and either fill or thoroughly rinse them with water. If the barrels have previously been stored in a dry place, a good soaking is absolutely necessary. An old barrel or other good-sized vessel should be provided to hold the offal, which, by the way, should always be got rid of as quickly as possible after each day's work is finished. If the herrings are to be selected—and this should be done if they show much difference in size and condition—a basket, tub, or other vessel will have to be provided for each selection.

The knife universally used for the gutting of herrings is a sharp-pointed, short-bladed knife with a fixed handle, which should be obtainable at any ironmonger's shop. The extreme length of the blade is about  $2\frac{1}{2}$  inches, and the handle is about 4 inches.

Scotch girls who are employed in the curing of herrings wrap cotton or linen rags round the thumb of the right hand and the thumb and at least the forefinger of the left hand; and this is a good plan for any novice to follow to lessen the risk of accidents.

In gutting, take hold of the herring about the middle with the left hand, the thumb being over one side and the rest of the fingers over the other, and the throat of the fish exposed. Insert the knife through the gills, with the edge towards the operator: give the knife a sharp turn upwards, and draw the right hand outwards over the herring's head. If the operation has been entirely successful, the gills and stomach, etc., will have been completely removed; if it has not, a second movement will be necessary. Gentle pressure with the left hand assists the operation. In drawing out the intestines, however, care should be taken to draw the right hand *outwards* rather than *upwards*, as the latter movement is apt to tear the fish if they are tender. If the gutting is neatly and properly done, very little of the fish will have been removed—only the pectoral fins and upwards to the gills.

In an emergency herrings might be gutted without a knife, but the work would be slower and the results less satisfactory.

The *selection* of herrings is more fully discussed in a later chapter.

“**ROUSING**” AND **PACKING**.—The most important process in the curing of herrings is known as “*rousing*.” This is best done by hand in a large tub. A few platefuls of salt are first thrown over the gutted herrings, after which the packer turns them up thoroughly from the bottom of the tub, until every herring has come freely into contact with the salt. They are now ready for packing. A tight barrel or kit, damp inside, is placed beside the rousing tub, and the packer lifts a couple of handfuls of the roused herrings, shaking the salt freely from them, and drops them gently into the barrel. Salt should not be spread in the bottom of the barrel before the herrings are put in. The packer commences by placing one herring on its back, against the side of the barrel; two others are placed against it, their heads to the sides of the barrel, and their tails meeting or overlapping; a middle herring is placed in front of the tails of the last two, followed by two more with their heads to the sides of the barrel, and so on till the tier is complete. The herrings should be set well up on their backs, and the tier should be tight. Salting is an important matter. The exact amount of salt to be used on each tier should depend on the size and strength of the fish, the strength of the salt, the market the herrings are destined for, and the length of time they are likely to be kept in stock. Large-sized herrings require more salt to each tier than small, and full herrings more than spent, but in no case should the herrings be buried in salt. As a general rule, one barrel of salt will be required to cure three barrels of herrings.

Upon the heads of the herrings of the first tier two herrings (known as “*head herrings*”) are laid at each side, and above these the second tier is laid, the herrings crossing the first tier at right angles. Salt is again sprinkled over the tier, head herrings laid, and the third tier crossed over the second, and so on till the barrel is filled. Usually the herrings are packed above the level of the barrel, as they sink rapidly in the salt. On the following or second morning the herrings should be filled up level, the ends put in and “*tighted*,” and the barrels laid on their sides. Before this filling-up it is usually advisable to lift off the top tier of the original, and wash the herrings in pickle, to remove any discolouration resulting from exposure to the air. After the barrels have lain on their sides for eight or ten days they should be bored in the bilge, set on end, the

heads taken out, and the pickle run off through the bung-hole. A barrel of herrings will be required to fill up five or six barrels, and the filling-up should be done, when possible, with the same fish as those being filled up. Before starting to fill the barrels, the herrings in each barrel should be pressed down with the hands, and this will be most easily done while the pickle is being run off. The herrings to be used for upfilling should be well washed in clean pickle in a large-sized tub. A ring of herrings laid round the sides of the barrel, with their backs to the wood, will ensure firmness in the packing. The filling-up should be done in the same way as the original packing, except that each herring should be handled separately, and pressed into the proper shape for its position in the tier. Great care should be taken with the top tier, which, to make a full barrel, should show above the chimb of the barrel in packing. Each herring should be pressed between the thumbs and fingers of the packer, so that the belly of the fish will be flattened out, and the herrings should be set straight up on their backs. When the tier is complete the heads of the herrings should be pressed down, and *three* head herrings laid at each side. These also should be set straight on their backs. Very little salt should be laid between the tiers in the upfilling, and none at all on the top tier. A little clear pickle thrown over the top tier improves the appearance of the fish. Pressure is required to get the head in, the cooper usually having to get up on the barrel and bring his own weight to bear on the end. When the barrel is "tighted" it should be laid on its side and pickled at the bung, after which, if care is taken that the barrel does not leak, the cure is complete.



## CHAPTER II.

### THE HERRING CURING YARD.

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BEFORE laying out money upon a fishcuring establishment, every care should be exercised in the choice of a locality. The experience of recent years seems to be that only the large ports offer sufficient inducement to a curer to establish an expensive curing yard and buildings. The smaller ports on the East Coast of Scotland are now mostly deserted, commodious stores and workshops are left vacant, and grass is growing in yards that would be valuable investments for their owners if they could be removed to the larger centres. The larger ports, no doubt, have had, and still may have, their ups and downs, but with them progress has been the rule, while the smaller ports are being deserted. This state of matters will probably become more pronounced in the future. Steam vessels cannot work from the small ports, or, if they otherwise could, they require facilities for coaling, watering, and occasional repairs, which can only be found at the larger centres.

Having selected the port that seems most suitable, the next question that arises is the choice of the ground for the yard. This should be within a convenient distance of the harbour and fish mart, if at all possible. If it is an existing yard, the intending purchaser or lessee should satisfy himself that the drainage is above suspicion, and that there is an ample supply of water and gas.

The size of the yard and buildings must, of course, be determined by the curer's requirements, present and prospective, and the amount of spare capital available. But as it is generally both inconvenient and costly to enlarge an existing yard, it is well to provide room for a little extension of business in the future. If it can be arranged, access to the street should be had from more than one side of the yard.

This can be had by choosing a piece of ground extending all the way between two parallel streets, and if a corner

site can be obtained, with streets on three sides, so much the better. As to shape, a square or a right-angled parallelogram is generally conceded to be best. If the ground slopes, the gutting shed should, if possible, be erected on the higher ground. All the heavy work, such as the carrying of gutted herrings by the women, and the rolling of barrels of eured herrings, will then be downhill, with obvious advantages both to master and servants.

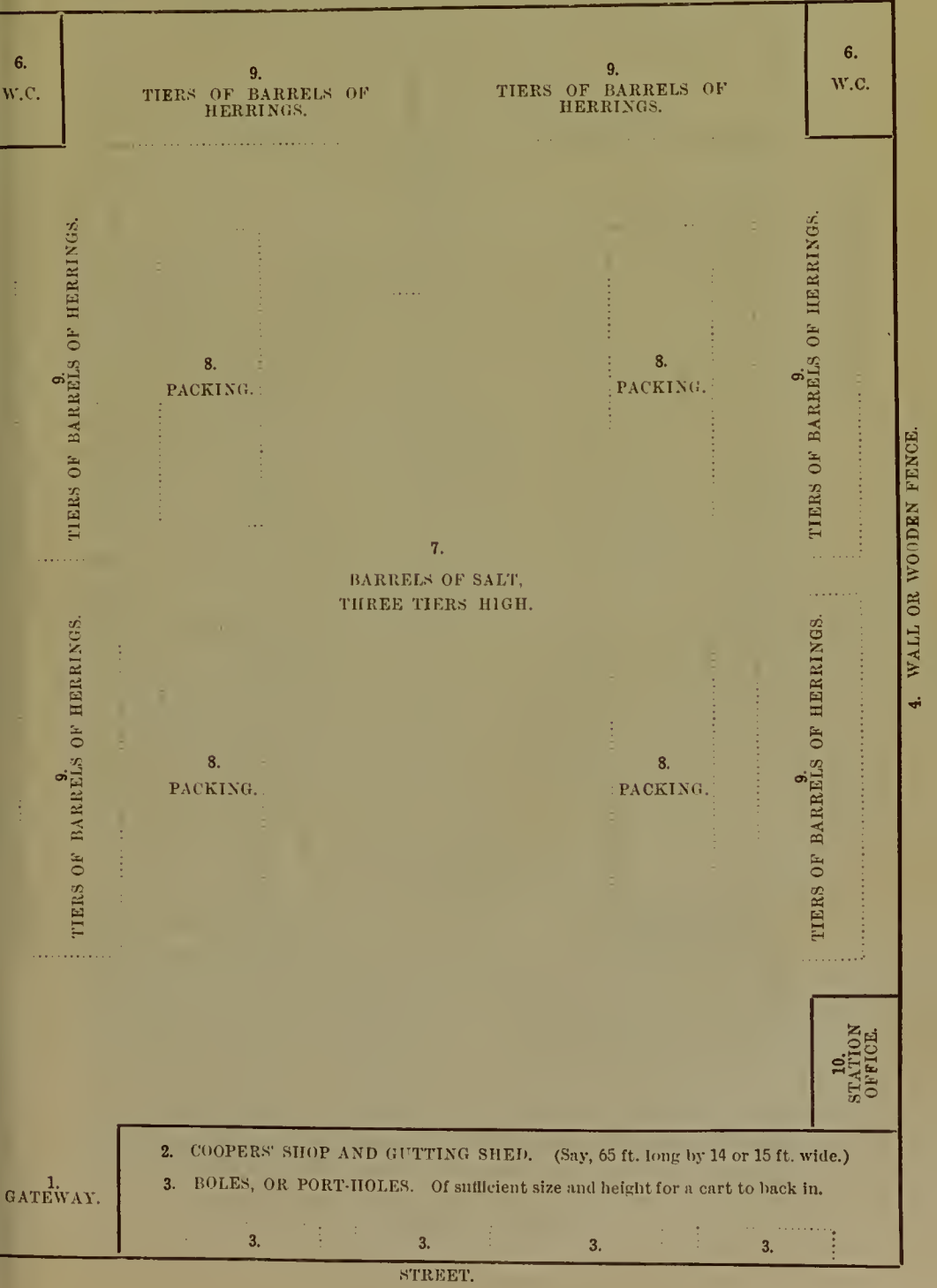
**SMALL HERRING CURING YARD.**—For a curer who requires a small place for the Scottish summer herring fishing only, a cheap and simple plan of a euring yard is shown on the opposite page; but in this case the curer would have to be sure that the authorities would not object to carts of herrings being backed and emptied into the gutting shed from the street. A frontage of 80 feet and a length of 120 feet would give over a thousand square yards of ground, and might be conveniently worked by four coopers and thirty women, or ten crews.

**GUTTING SHED.**—This frontage, after allowing for a gateway (1), would leave room for a gutting shed (2) of 65 feet to 70 feet in length and 14 feet to 16 feet in breadth, with 7 feet to 8 feet of a side wall. This might be a wooden building with permanent front and gables, but it would require to be quite open on the inside, the roof being supported on wooden or brick pillars. If this building were to be occupied as a cooper's shop after the fishing season was over, the inside wall would have to be made in sections, which could be taken off and set aside when required. Openings should be made in the front of a sufficient height and breadth for the end of a cart to be backed in to empty herrings. In the case of a wooden building, especially, it is necessary that substantial blocks should be laid on the ground to cheek the wheels. The "farland" or receiving-box would run along the whole length of the shed, in one or two sections as desired, but in either case two widths should be arranged for, to suit heavy or light fishings. The small size might occupy about a third, and the larger size about the half of the width of the floor. Strong staples and hooks at the ends, with short bolts fitting into sockets in the floor along the front, are the usual fastenings. A water tap, with india-rubber hose attachable, about the middle of the inside of the shed, and a good supply of gas for night work, would complete this building, unless a small loft—little more than a shelf, in fact—in one end, upon which to store lamps for outside work, spare barrel-ends, rushes, etc., were to be added.

GROUND PLAN (No. 1) OF SMALL HERRING CURING YARD.  
(Say, 80 ft. by 120 to 150 ft.)

5. BARREL STORE, with SALT CELLAR in one end.

(If women's lodgings have to be provided, there should be a loft in this store, divided off into suitable rooms.)



For a curer who intends to occupy the yard during the short summer fishing only, and is not obliged to put up women's quarters, this is really the only building required, with the exception of a small station office and tool store, as at (10), and a w.c. for each sex (6).

In this case all the salt would have to be filled into barrels and stored three tiers high, as at (7), with the empty barrels piled high above. The packing would be done at (8), where there is provision for four selections if necessary, and the filled barrels would be rolled out, as at (9), three tiers high if required.

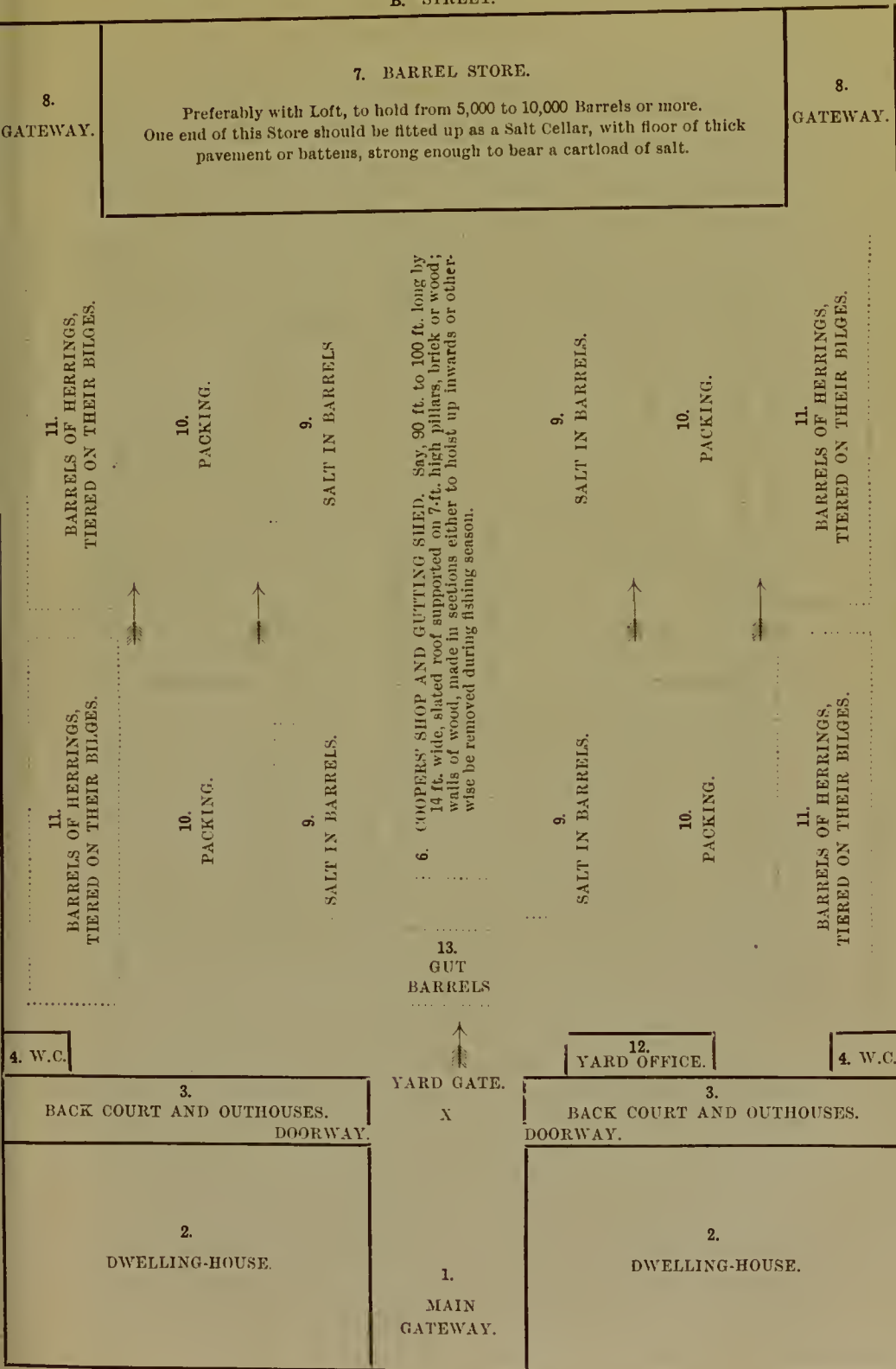
If barrel storage were required for the winter, and women's lodgings had to be provided for the summer, a building running either wholly or partly across the *far* end of the yard would best answer requirements. A loft above could be fitted up into suitable rooms, and the lower portion would serve as a barrel store and salt cellar.

The plan on the opposite page shows the ground plan of a larger and more expensive curing yard, extending between two parallel streets, with a frontage of 150 feet to 200 feet to each street. From the main gateway (1) the ground slopes in the direction in which the arrows point.

**DWELLING-HOUSES.**—Sites for dwelling-houses are suggested at (2), partly as a promising investment and partly because in some Scotch burghs it would be a condition of the lease or feu charter that dwelling-houses up to a certain specification should be erected along the front of the ground. For outhouses, etc., sufficient space would have to be allowed behind the dwelling-houses; and this space would have to be walled off from the curing yard, as at (3). A gate at X would close the yard at any time, without inconvenience to the tenants of the dwelling-houses.

**GUTTING SHED AND COOPER'S SHOP.**—A building situated in the middle of the yard as at (6) would serve as a cooper's shop in the winter and as a gutting shed during the fishing season. To give accommodation for fifteen crews of women, it should be from 90 feet to 100 feet long by 14 feet or 15 feet wide, with slated roof, supported on pillars of brick or wood, 7 feet high. The gables might be either of wood or masonry—preferably the latter—but the side walls should be of wood, and made in sections, either to hoist up inwards or be otherwise removed during the fishing season. The side intended for the front of the cooper's shop would have to be well furnished with windows, and these would have to be so fitted as not to interfere with the hoisting or removal of the side sections.

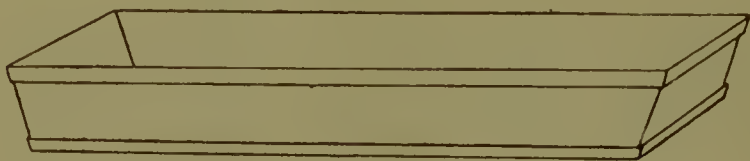
# GROUND PLAN (No. 2) OF HERRING CURING YARD. B. STREET.



A. STREET FRONT, say, 150 to 200 ft.

The farlands would extend from end to end of the shed, say, two farlands, each 40 feet to 45 feet long by 6 feet to 9 feet wide; three, each 25 feet to 30 feet long, or four of 18 feet or 20 feet in length. In either case there should be passages between the ends of the farlands, to allow the women to carry herrings to the opposite side of the yard.

In the ground plan No. 1, the front of the gutting shed served as one side of the farland, but here a complete farland would be necessary. It may be described as a shallow, oblong box, standing



about 2 feet high, with the sides and ends sloping inwards to allow the gutters to stand the more easily when working, as here figured. In the yard under discussion the farlands would be set up along one side of the shed, close to the pillars. The carts would be emptied at that side, and the women would work at the other side of the farlands, well under the roof of the shed.

**PACKING, ETC.**—Barrels of salt might be tiered up at (9), for convenience; the packing would be done at (10), and the barrels of herrings, when headed up, would be tiered away at (11). Gateways (8) to street B would greatly facilitate the work of carting away herrings for shipment, etc. Instead of being parallel, (9), (10), and (11) might, if preferred, be placed at right angles to (6). In this case, however, (9) would be represented by a single pile of barrels of salt on each side, placed at right angles to the middle of the shed (6), and a selection of herrings (10) would be packed on each side of the salt.

**THE STORE.**—The store (7) should be a substantial stone and lime building with slated roof, made to hold from 5,000 to 10,000 barrels or more. As each barrel occupies about  $4\frac{1}{2}$  cubic feet of space, the curer would know pretty accurately from his plans what the capacity of his proposed building would be. One end of this store should be fitted up as a salt cellar, but not necessarily divided off from the rest of the store. The salt cellar should have a floor of thick pavement or battens, strong enough to bear the weight of loaded carts. In the inner wall of the store—*i.e.*, fronting into the curing yard—there should be at



least two sliding doors, high and wide enough to admit a loaded cart. One of these doors should be near enough to the salt cellar to allow carts to be backed inside and emptied. The store might have a loft running along its whole length, if required. If not, a small loft in one end would be useful for many purposes, such as storing away tools, truss hoops, etc., during the fishing season, and keeping small stores throughout the year. It is well to keep tools and truss hoops well away from the influence of salt and pickle during the fishing season, otherwise they are apt to rust. When preparing plans and drawings for a store, it would be well to bear in mind that a herring barrel is about 31 inches long by 21 inches in extreme diameter, and the height and breadth of the store should be calculated so as to have no serious loss of space.

**WOMEN'S LODGINGS.**—If women's lodgings had to be provided in addition to the dwelling-houses (2), there would have to be a loft in the store (7), divided into suitable rooms, to which there should be access by outside stairs.

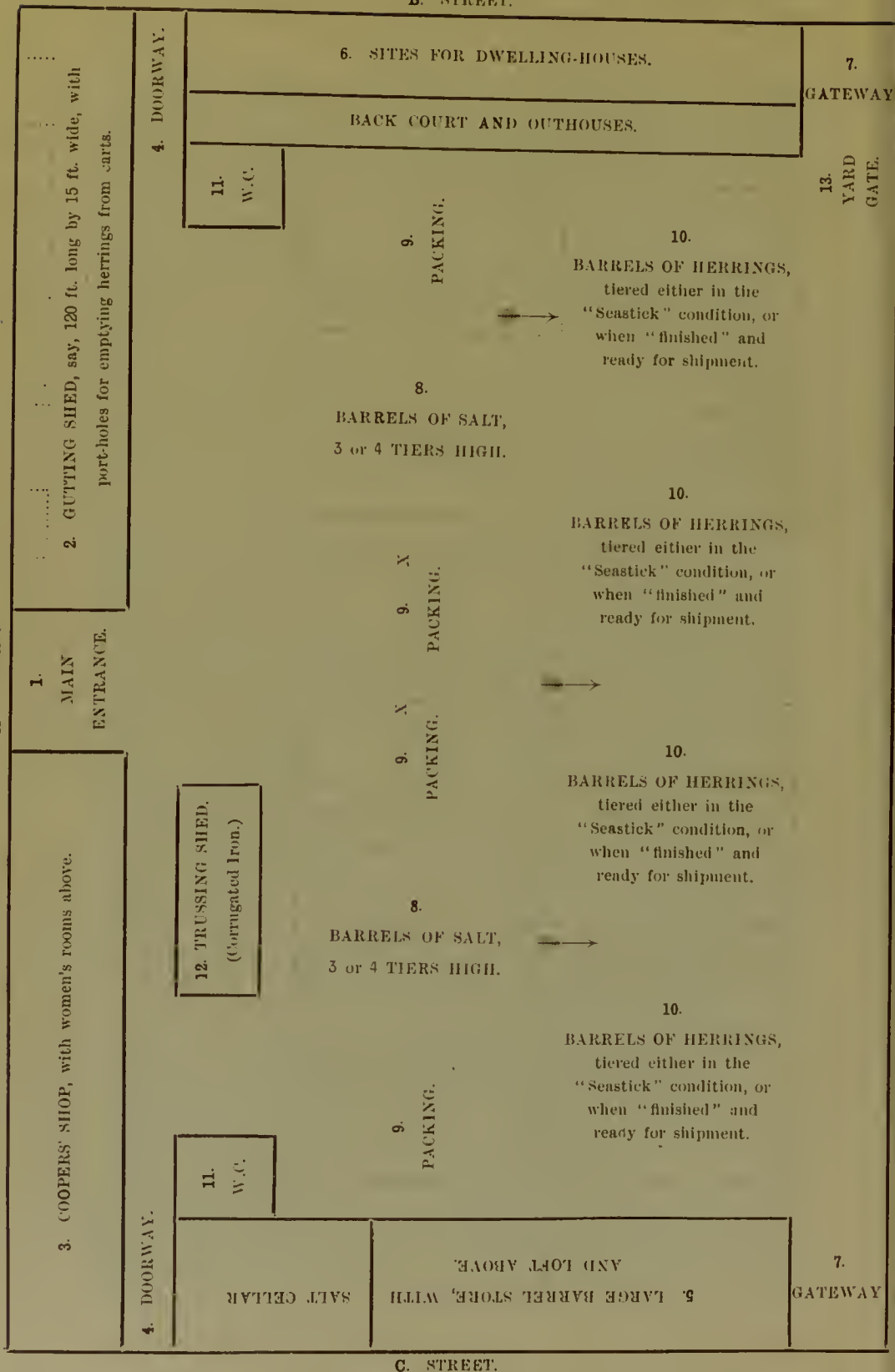
**MINOR BUILDINGS** would be a small office (12) inside the gate and a w.c. for each sex. If (7) were to be used only as a barrel store and salt cellar, (4) would be the best position for the w.c.'s, to allow for an easy connection with the drainage system for the dwelling-houses. Another useful small building would be a trussing shed, in which to "fire" the barrels. For a yard like this there might be two trussing sheds, situated as near the cooperage door as possible, with two or three "firing berths" in each. These trussing sheds should be cheap erections of corrugated iron, well ventilated at the apex of the roof, and so fastened that they could be taken down and removed out of the way during the herring fishing season. Six to seven feet would be a sufficient height for the side walls, and the breadth need be no greater than to allow a man to move comfortably round his barrel when trussing.

Nothing has been said in this article about water or gas, but it will be understood that an ample supply of both should be provided at the gutting shed at least. "Gut barrels," to hold the herring offal, might be set at (13), which should be paved with concrete for cleanliness.

**GUTTING SHED AND COOPERS' SHOP.**—Ground plan No. 3, which appears on the following page, shows a plan of a large yard on a corner site, with streets on three sides, the adjoining property being most probably another curing yard. The ground slopes from street A in the direction

# GROUND PLAN (No. 3) OF LARGE HERRING CURING YARD.

B. STREET.





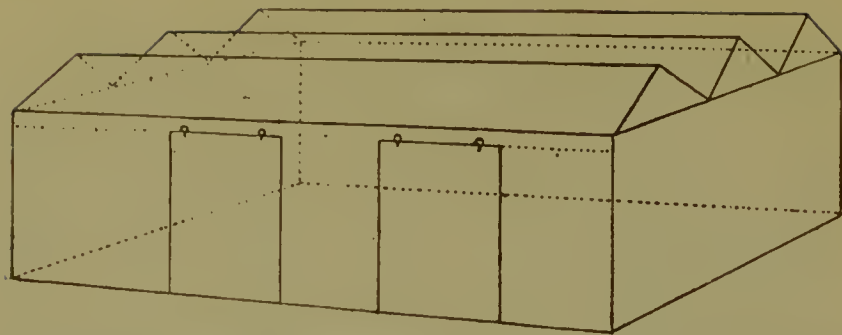
in which the arrow heads point. Separate buildings are here suggested, on opposite sides of the main entrance, for the gutting shed and coopers' shop; but it might be advisable to have the gutting shed longer, and the cooperage shorter, than shown on the plan. The coopers' shop might be so constructed as to serve as a gutting shed also during the herring fishing season, if required. In this case, as in Plan I., provision is made for emptying the herrings through port holes in the front of the shed (2) facing the street (A); and the inside wall would have to be made to open from end to end, either by hoisting the sections inwards towards the roof, or by lifting them aside during the fishing season. The latter would therefore have to be of wood or corrugated iron, but the front wall and gables should be of mason work, with a slate roof. The coopers' shop (3) might be all of mason work, with an upper flat fitted up as women's quarters. The trussing shed (12) might, in this yard, be a fixture.

Sites for dwelling-houses are suggested at (6), fronting street B, and a large barrel store, with commodious salt cellar in one end, and loft running the whole length of the building at (5), fronting street C.

Doorways at (4) would be convenient, and they should be wide enough to let a herring barrel be rolled through easily. Gateways at (7), wide enough to let a lorry through, would provide the best outlet for barrels of cured herrings for shipment. If gate (7) at street B were used by the tenants of the dwelling-houses, an inner yard gate might be necessary at (13).

Barrels of salt piled up at (8) would be in a convenient position, and the packing would be done at (9) on either side of the salt. This would allow for the packing of four selections. The two principal selections—*i.e.*, the kinds that are most numerous—should be packed nearest to the gutting shed, to give the women as little carrying as possible. The barrels of herrings, when "tighted," would be rolled to the lower half of the yard (10), where they would lie till they were filled up, and, if necessary, branded, and afterwards wait for shipment.

**PACKING SHED.**—Nothing has hitherto been said about a packing shed; but where there is room and convenience for it this is a most useful building to have in a curing yard. On ground plan No. 3 there would be a very suitable site at 9x. The packing shed, in its simplest form, is merely a roof set upon pillars, inside of which packing may be done in comfort in wet weather. In a yard like that



under discussion, however, the building (of which I herewith give a sketch, showing construction of roof and sliding doors) should be long and broad enough to allow two selections of herrings to be packed in it at once. The roof should be of slate or corrugated iron, and should be well supplied with skylight windows. For night work a good supply of gas should be led along the joists in the centre of the building. The pillars might be 10 ft. or more in height, and the building should be closed in all round, the walls being made in sections, either to slide on pulleys or to hoist up inwards. A building of this description would be useful all the year round. In winter it would be used for storing staves and heading, hoops, etc.; and by opening sections or doors on opposite sides of the shed a draught would be created that would thoroughly season the wood and keep it in good condition. Then, in the event of the other buildings being filled up, a considerable number of barrels might be stored in the packing shed instead of being put outside, as is often the case during the spring or early summer.

In ground plan No. 1, if there were no store in the upper end of the yard, its place might be taken by a packing shed near and at right angles to the middle of the gutting shed.

Occasionally a packing shed is constructed high enough to have a loft in it. The only drawback to this arrangement is that the packers can only get light from the sides; and in a broad building such as this, the centre, where the work is principally done, can only be well lighted from the roof. A compromise between the two arrangements is to leave a number of the flooring boards unfastened in the centre of the loft, and to have windows in the roof directly above, so that when the loft is empty the boards may be lifted and the light admitted.

PLANT.—The plant required for a business employing,

say, half a dozen coopers and fifteen crews of women (three in each crew) would be as follows:—Each packer would require four rousing tubs, making a total of sixty, at least, for the yard. A rousing tub should be large enough to hold as many herrings as will fill a barrel. A common size is about 27 in. wide by 15 in. to 18 in. deep.

Each crew of women would require six carrying tubs or other suitable vessels—for instance, a small “spale” basket might be given to each woman instead of one of the tubs. This would allow one carrying tub to each woman for each of the two principal selections, and one between them for each of the smaller selections. The carrying tub used in the Scotch trade is about 10 in. deep and of the same width as the end section of a herring barrel, being made in the smaller hoops of a barrel truss.

Each gutter would require either a small “cog” or a tin basin into which to throw the offal; and each packer should have a similar, or rather wider, vessel in which to keep salt for laying on the tiers of herrings as she packed them.

A vessel large enough to hold a barrel lengthwise, either an oval tub or an oblong tank, is a very essential item in a fishcurer's outfit, and for a large yard there should be two, one at each side. In these tubs the empty barrels are immersed and tested as to their tightness before being filled with herrings.

For a business of the above description, from 700 to 1,000 barrel covers should be provided for laying on the tops of the “upsets” or newly packed barrels. If many half-barrels are likely to be used, there should also be a supply of half-barrel covers. The covers should overlap the barrels by about an inch all round. They are made with two bars nailed across them, and should be well coated with coal-tar on the upper side.

Small stores include a supply of gutting knives and tin salt plates, “flags” or rushes for tightening barrels, spare hoops, both iron and wooden, for repairs, a torch lamp for each packer, and a supply of oil (usually creosote or paraffin). A wheel-barrow, a scavenger's scraper, and brooms are indispensable for cleansing purposes.

## CHAPTER III.

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### THE BUYING, SELECTING, AND CURING OF HERRINGS.

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**BUYING.**—When the curer has got his curing yard arranged to his mind, his next concern is the buying of his herrings. This is a most important part of the business. A capable, judicious buyer may make money in herring curing when a less competent judge of herrings may find it impossible to hold his own. Here, however, as in most other walks in life, there is no royal road to success: a curer has to learn by experience, and profit by his mistakes. But if he has in his employment a man who shows any special ability in judging and buying herrings, that man's services should be duly appreciated and, if at all possible, retained.

In the Scotch trade the fish are mostly sold by sample, and as the quality, as a rule, varies greatly, much care and judgment are required on the buyer's part, especially after spent herrings begin to make their appearance. Each sample purchased should then be counted in the salesman's presence, and the numbers of the different selections marked on the docket; then, while the fish are being discharged, the bulk should be tested, once or oftener, to make sure that the fish are as good as represented. On the Norfolk and Suffolk coast the quality is generally much more uniform than in Scotland.

**ROUSING IN THE FARLAND.**—When the curer has made his first purchase, the process of curing commences when the herrings are being emptied out of the carts into the farlands. A cooper should be in attendance to throw platefuls of salt on the fish as they are emptied out. If the herrings are to be gutted at once, a light, regular sprinkling of salt will be sufficient; but if they have to lie all night in salt, the "rousing" should be heavier, and, if possible, the herrings should be turned over with a shovel during the process. Apart, however, from fish which are likely to have to lie a good few hours in salt before being

gutted, shovelling should be done sparingly, especially if the herrings are soft. Rather than have much shovelling, many curers prefer to "rouse" into barrels any fish that are likely to lie overnight; and they can be afterwards emptied into the farland as required. This rousing must, of course, be done at the boat's side. Along with his empty barrels, the curer brings down as many barrels of salt as he is likely to require, according to the quantity of herrings purchased; an empty barrel is placed in a convenient position, and a cooper takes his place immediately behind it with a salt plate, and a barrel of salt within easy reach. When the fishermen lift a basket to empty the herrings into the barrel, it is the cooper's duty to see that the fish are well and regularly salted. The fishermen should empty the baskets slowly, stopping, when necessary, till the cooper replenishes his salt plate. It is not sufficient to sprinkle salt into the barrel, it is much better to throw it over the herrings as they are leaving the basket, and after each basket is emptied the barrel should be well shaken to make sure that the fish are thoroughly roused. If, as is usually the case, the gutting is done at only one side of the farland, it is a good plan to have wooden shoots to run the herrings across to the women's hands. In a gutting shed with port-holes these shoots may be fixtures, and in other cases portable sections of boarding about the breadth of a cart.

**SELECTION.**—The process of gutting has been fully described in Chapter I., but nothing was said then about selection. "Trade mark" curers—*i.e.*, those who do not use the Government or "crown" brand—have generally standards of selection of their own, but it will be sufficient for our present purpose if we take the Scotch Fishery Board's sizes.

"**LAFULL.**"—Of these the first is the "lafull" selection. Herrings intended for the crown lafull brand must be "large full fish of not less than  $11\frac{1}{4}$  in. in extreme length" when cured. If, on examination, more than fifteen spent, torn, or broken, or more than fifteen undersized herrings are found in the original packing of a barrel, or more than six in the filling up, the inspecting officer is entitled to withhold the brand.

"**FULL.**"—For the "full" brand the herrings should be "full fish of not less than  $10\frac{1}{4}$  in. in extreme length when cured." Eighteen objectionable herrings in the original packing and nine in the filling up constitute the limits allowed for this brand. For both the "full" and



“lafull” brands the herrings should be quite full of milt or roe.

“MATFULL.”—“Matfull” herrings are  $9\frac{1}{4}$  in. long when cured, but in this case it is sufficient if milt or roe is clearly visible at the neck or throat. If more than twenty-one defective herrings are found on inspection in the original packing of a barrel, or more than nine in the filling up, the officer is justified in rejecting the fish.

“LA SPENT.”—For the “la spent” brand the herrings should be not less than  $10\frac{1}{4}$  in. in extreme length when cured. If more than eighteen objectionable herrings are found in the original packing, or more than nine in the filling up, the fish are not considered worthy of the brand.

“SPENT.”—The crown “spent” brand is applied to barrels of “spent” or empty fish of less than  $10\frac{1}{4}$  in., but not less than 9 in. in extreme length, provided not more than eighteen objectionable herrings are found in the original packing, or more than nine in the filling up.

“MATTIE.”—The “mattie” brand is put upon barrels of small-sized herrings that are ineligible for any of the other brands. They must, however, be at least 9 in. long, and the original packing should not contain more than thirty, nor the filling up more than twelve, torn or otherwise defective fish. To be eligible for this brand, however, the fish must not have been caught on the coast of Shetland before the first of July, or on the East Coast of Scotland before July 10; and the presence of an excess of oil in the barrels may also disqualify the herrings for the brand.

To assist in the selection, wooden gauges, with the various lengths marked on them, should be kept beside the farland—at least one gauge for every cooper. Notches showing these lengths may also be cut on the upper edge of the farland in front of each woman, for reference when required. The men in charge of the packers can give material assistance in the matter of selection by frequently examining the herrings in the rousing tubs, and reporting any defects. All fresh herring gauges should be a quarter of an inch, at least, longer than the regulation sizes for the cured fish, to allow for shrinkage of the fish during the process of cure.

“ROUSING.”—The necessity for having the herrings thoroughly roused by the packers has been emphasised in Chapter I., but the importance of this part of the work is a sufficient excuse for reverting to it. When the women are kept busy, and especially when their hands begin to

get sore, some of the packers may be found doing this part of the work in a careless and slovenly manner. The cooper in charge should, however, guard against any neglect of this part of the work, as it is the rousing and pickling that really preserve the fish. If herrings have not been properly roused it will at once be seen in the condition of the fish when the barrel is opened for inspection. The herrings will then be found sticking together in the tiers, and when separated they will be scaleless and discoloured, with a brown gum adhering to the skin. Such herrings will not taste so well as properly cured fish, and they cannot be depended upon to keep for any length of time.

It may be worth remarking here that herrings should not be allowed to lie longer in the rousing tubs than can be helped, otherwise the salt drains them too much. Such herrings, when at last packed, are usually found to have lost their original pickle. The salt may be lying white and undissolved between the tiers, and the herrings are usually too hard cured. If, therefore, the foreman sees a packer getting far behind her gutters with her part of the work, he should insist that one of the latter should come out to assist the packer until the rousing tubs are emptied.

Chapter I. described the process of filling up. It should be understood, however, that any objectionable herrings seen during the filling up should be kept out; the selection for the up-filling of a barrel should be perfect.

**CLEANLINESS.**—It is scarcely necessary to say that every curing yard, and all curing utensils, should be kept as clean as possible. In actual experience, however, the reverse is too often the case. Workers may be seen literally wading in pickle, dirty salt, and fish offal, where an occasional hour of a labourer with a scavenger's tools would keep the place dry, clean, and tidy. If men and women have to work day after day in dirty, comfortless surroundings, it need not be wondered at if they lose interest in their work and become careless and slovenly.

In the long run it will generally pay the curer well to see that his yard is kept tidy. Coopers and women will soon realise that the best they can do is expected from them, and that nothing less than their best will satisfy. Sooner or later the curer's customers also, from the large wholesale agent who buys his cured herrings on the Scotch or English coast to the retail dealer who finally disposes of them in the interior of Germany or Russia, will recognise the merits of the curer's brand, to his ultimate profit.

## CHAPTER IV.

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### THE HEBRIDES, IRELAND, AND SHETLAND.

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THE herrings caught and cured in May and June at the Hebridean and Donegal stations are known in the curing trade as "matjes." Being delicate and generally costly fish they have to be even more carefully cured than East Coast herrings. They do not—or should not—contain milt or roe, and they are much fatter than herrings in that condition. Their stomachs are usually found filled with such food as small shrimps, or other free-swimming crustaceans, mackerel midges, small sand-eels, etc. It is necessary that the gutting be carefully and thoroughly done, otherwise the contents of the stomach and the fat adhering to the long gut may cause the fish to deteriorate. "Matje" herrings should be gutted as soon as possible after being landed. They should never, if it can be avoided, be allowed to lie long exposed to the sun. The women should be prevented from setting carrying baskets upon the herrings in the farlands; apart from the indispensable "gut cog," no weight should be allowed to be put upon them.

SELECTION AND CURE.—As a rule, there are only two selections, large and medium; broken, torn, or very small fish are thrown aside. Most curers use English salt (second fishery) for rousing, and Spanish salt for laying on the tiers. After the herrings have been well roused, the rousing salt is shaken from them before they are lifted out of the tub; then, as each tier is laid, a little Spanish salt (only a few grains) is sprinkled over it. As the salt shaken off after the rousing would soon accumulate in the tubs, these should be emptied frequently to keep the herrings clean. All rousing tubs should, of course, have several bungholes bored in their bottoms to allow the blood to escape. This applies to both East and West Coast curing.

PICKLING.—Immediately after a barrel of "matjes" is packed, a quantity of clean *made* pickle should be poured



into it—about a bucketful to a whole barrel, and half that quantity to a half-barrel. The usual rough-and-ready method of making pickle is to dissolve salt in clean water until the liquid is strong enough to float a fresh herring or a potato, preferably the latter. A special form of hydrometer registering up to 40 per cent. is also used. Put into the natural pickle which herrings produce in the process of curing, this hydrometer usually shows a buoyancy of about 20 per cent. For “matje” curing, pickle made from Spanish salt is generally used; and, as the curing of the fish depends mostly upon the pickle, it should show a buoyancy of 25 per cent.

**FILLING UP.**—After standing on end for two nights, West Coast “matjes” may be filled up for the first and last time. The surplus pickle is usually poured off over the chimb of the barrel, and not through the bunghole. The barrels are never filled so hard as on the East Coast. In the filling up it is scarcely necessary to say that all herrings which are in the least objectionable should be laid aside.

If not intended for immediate shipment, “matje” herrings should be carefully covered up to protect them from the sun. If there is no shed available they should be covered either with empty barrels or with barrel covers. When shipping, the curer should make sure that his barrels are put into the hold, and not upon the vessel’s deck. With the hot weather usually experienced in June, a deck cargo of “matje” herrings may be fairly scalded on a voyage from Ireland or the Hebrides to a German or Russian port.

**SHETLAND MATJES.**—In the Shetland herring fishing there are points of similarity to both the East and West Coast (of Scotland) fishings. The season is a long one, extending, roughly, from the beginning of May till the middle of September, or later—the western stations being the earliest in the district and the south-eastern the latest. Until the middle of July, or later, the Shetland herrings are generally all more or less of a rich oily nature; and though the larger proportion may contain milt or roe in a more or less advanced state of development, there is usually a fair proportion of “matjes” also. In fact, curers who lay themselves out to cure “matjes” in Shetland can generally get a selection of this class of fish during the greater part of the season. As showing the extent to which “matje” curing is now carried on in Shetland, it may be mentioned that the annual exports from the dis-

trict to St. Petersburg average over 100,000 barrels, whereas the combined exports from Stornoway and Castlebay to that port are generally less than half that quantity. The fancy prices which are generally obtained in the Russian port for best Irish and Castlebay matjes are never realised, or even approached, for the Shetland fish; but, as their fresh herrings are bought much cheaper, the Shetland curers appear to find the trade a profitable one, and it has been extending.

**BRANDING.**—Very few herrings are selected for the crown brand in Shetland till near the end of July. From the beginning of August onwards, however (apart, of course, from “trade markers”), branding becomes universal. The most noticeable difference between the Shetland herrings and those landed at the East Coast (of Scotland) stations is that the former are much larger, on an average, than the latter. When selected for the crown brand, therefore, the Shetland fish generally yield a large proportion of lafull herrings, but very few matfulls or matties.

**AMERICAN TRADE.**—While Shetland “matjes” have been finding an increasing outlet by way of St. Petersburg, Shetland large fulls have been quite as steadily growing in favour in America. New York is the principal market for them, but Boston, Philadelphia, and some other ports also take supplies. There are no direct shipments to America. The large herring wharves and stores which are such important factors in the trade at the Baltic ports are practically unknown in the United States, probably because the trade there is yet in its infancy. The cured herrings find their way, generally in lots of a few hundred barrels or less from each sender, to Glasgow or Liverpool, whence they are forwarded to their destination by the large Atlantic liners. Only goods of the very best quality and cure, not too heavily salted, are wanted in America, and nothing else need be sent. Although Scotch curers “consign” freely to the German and Russian markets, they are generally chary about risking consignments to America, preferring, if possible, to sell their herrings before shipment. Seeing that the fish are mostly sold in small lots, curers for the American markets have thus to be prepared to hold up considerable quantities of their stock, often for months together, waiting sales. This means the tying up of capital, which many curers, with other fishings to prepare for, cannot spare; so the American trade has hitherto remained in comparatively few hands.

## CHAPTER V.

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### THE CONSTRUCTION OF AN OUT-STATION.

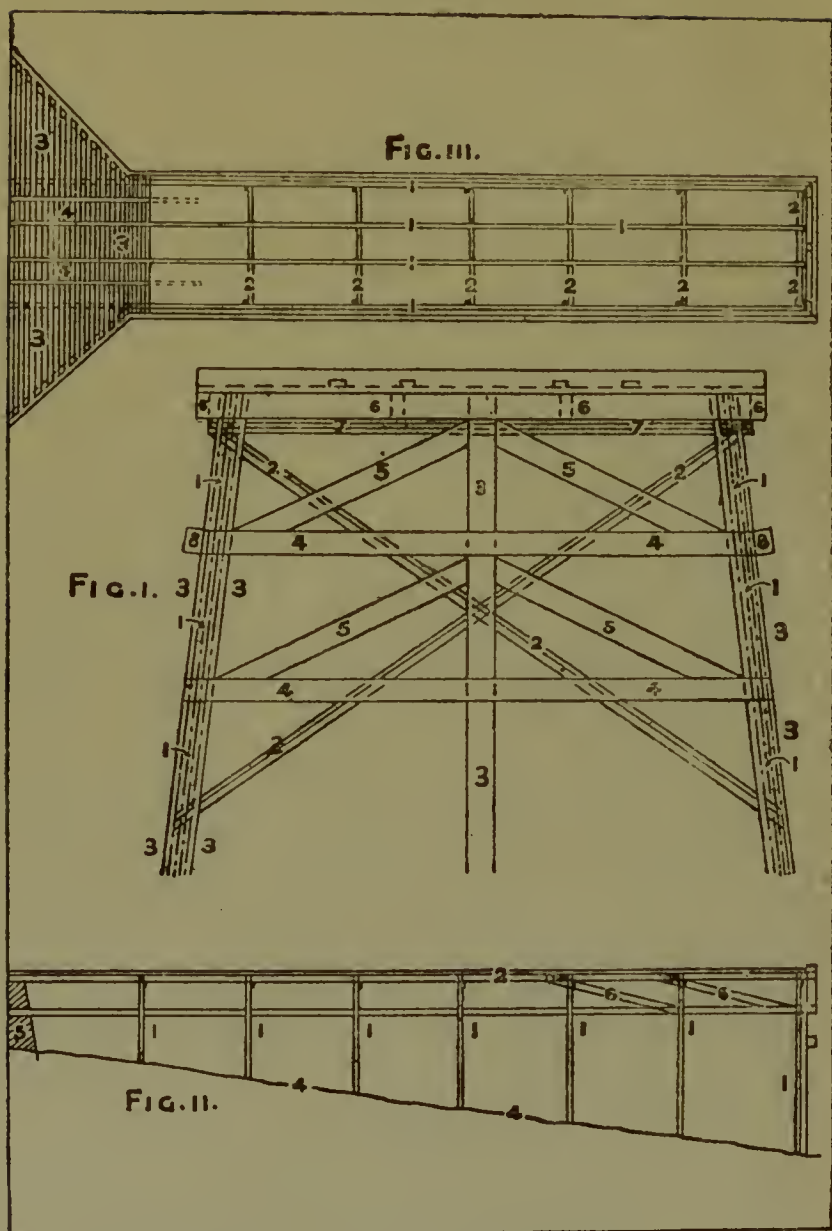
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WEST Coast and Shetland stations differ from East Coast stations in several important particulars. In the former case the curer has to build his own wharf or landing-stage, and generally also houses to accommodate his workers. The selection of a site is, therefore, an even more important matter than on the East Coast. Inside some well-sheltered harbour the curer has to find suitable depth of water, and soft or, at least, *clean* bottom, where boats or vessels will sustain no damage if they should take the ground. On shore there must be nothing to prevent the curer from excavating and levelling the ground to the desired gradient at a reasonable cost; and the surroundings of the dwelling-houses must be above suspicion from a sanitary point of view.

OUT-STATIONS IN THE HEBRIDES.—It was in the Hebrides that these out-stations, as now understood, were first constructed; and they may be said to date from the great development of the herring fishing at Castlebay about the end of the "sixties" and the early "seventies." Before that period, curers at out-stations in the Hebrides, Orkney, and Shetland had generally been content either to utilise some existing pier, or to work upon open beaches, where fishermen ferried their herrings ashore from the anchorage in small boats, or ran their herring boats aground abreast of the curing stations, and carried their herrings ashore when the tide ebbed.

SHETLAND STATIONS.—Shetland began to attract attention about a dozen years later than Castlebay. Partly, perhaps, profiting by their own or their neighbours' experience at the Hebridean stations, and partly because of the heavier fishings generally landed in Shetland, curers have usually made their Shetland stations larger, their sea-walls and landing-stages more substantial, and their dwelling-houses more commodious than in the Hebrides. But even in Shetland itself this process of development has

## PLAN A.



been evident: stations constructed in recent years being generally larger, costlier, and more elaborate than formerly. A description of one of these modern Shetland stations may be interesting, as they are probably the best of their class.

SIZE.—A common size is from 150 feet to 200 feet of frontage (occasionally 250 feet, or even larger), with the right to go at least as many feet inland. Operations should be commenced by the building of a retaining wall, preferably of concrete, along the whole front of the ground near or beyond the low-water mark. As this wall will be subjected to great pressure from behind, and often exposed to heavy surf in winter storms, it should be strongly built: say, from 18 inches to 24 inches thick at the top, and from 4 feet to 5 feet thick at the foundation. It is the rule that deep harbours have steep shores, so some excavation is usually required to bring the station ground to the desired level; and the material thus dislodged is useful for filling up the space behind the retaining wall. A gradient of 1 foot in 14 feet gives a sufficient slope to make a dry station, and not too much for convenience in working.

WHARF.—As it seldom happens that there is sufficient depth of water at the edge of the retaining wall, this defect is remedied by running out a wharf or landing-stage constructed of wood resting on iron trestles. Plan A, fig. I., shows the outer section of the frame of such a wharf. The *legs*\* or supports (1) and cross-heads (7) are constructed of heavy rail iron with diagonals (2) of angle iron, 3 inches by  $\frac{1}{2}$  inch, all securely fastened with inch screw-bolts. To strengthen the frame of the wharf, and protect the iron rails from being snapped by the sudden impact of a boat or vessel, it is wise to set pitch-pine logs (3) *outside* the iron rails of the outer trestle, a similar log being set in the centre, outside the diagonals. These logs should be at least 10 inches by 6 inches, and to prevent them from being worm-eaten they should be dipped in creosote, and covered with galvanised steel sheeting from about a foot above high-water mark downwards. They should be bolted to the iron rails with four 1-inch screw-bolts through each leg. With these additional supports the wharf will be better able to stand the chafing and strain of vessels alongside, and there will be less vibration when there is heavy traffic on the jetty. Similar logs might with advantage be set up alongside the next two trestles. Cross beams (4) of pitch pine, 10 inches by 6 inches, are necessary to keep boats from getting under the wharf. These should be outside the uprights, wooden and iron; and the wharf would be improved by the addition of diagonal cross

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\* This is meant to apply to the iron rail, which is drawn in the centre, and (3) to the pitch-pine log set outside the iron, with the close lines for the iron rails inside.



beams (5) of the same material as at (4). The ends of the four top "stringers" are shown at (6), and the ends of the high-water stringers at (8).

Fig 11. shows a lateral view of the frame of the wharf. The iron rails forming the supporting trestles are shown at (1). These stand 10 feet or 12 feet apart. No. (2) shows the top "stringers," of which there are four, upon which the cover or deck of the wharf rests. Another stringer (3) runs along each side of the frame, about the high-water mark. These stringers should be strong pitch-pine beams, at least 12 inches by 6 inches. The slope of the bottom is shown at (4), and the concrete retaining wall along the front of the station is shown at (5). Cross beams at (6) help to support the end of the jetty against pressure from the seaward.

Fig. III. shows the construction of the top of the wharf. The "stringers" already mentioned are shown at (1), and at (2) the crossheads of the trestles upon which the stringers rest. At (3) is shown the arrangement of the cover or deck, with a gradual widening of the wharf as it meets the front wall of the station. The cover is made of battens,  $6\frac{1}{2}$  inches by  $2\frac{1}{2}$  inches.

At (4) are shown two double lines of rails, which run from the point of the wharf up to about the middle of the station. These rails are fitted with a trolley each, the trolley being large enough to hold eight baskets of herrings. Four boats' crews can thus discharge their fish at once, two crews getting a trolley between them and putting on a cran each at a time. These rails are also useful for the discharging of curing stock, etc., or for running down barrels for shipment.

When boats were smaller and lighter, and before rails were much used, these landing-stages were seldom more than 15 feet wide, but nowadays a breadth of 18 feet to 21 feet is necessary.

DEPTH OF WATER.—A depth of 5 feet or 6 feet of water at the outer end of the wharf at low tide is absolutely necessary under present conditions. If, however, a foot or two more can be got by extending the wharf a dozen or twenty feet farther, there should be no hesitation about the additional expense. From wharves where the water is shallow most of the cured herrings have to be boated off for shipment, at a cost of 2d. per barrel; whereas, where the water is deep enough, cargo steamers will generally come in to a wharf, even for a few hundred barrels. Fishermen, too, soon come to know, and give the preference to, stations where they run no risk of taking the ground and losing a night's fishing.

## CHAPTER VI.

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### OUT-STATIONS — CONSTRUCTION OF DWELLING-HOUSES AND COST OF STATION.

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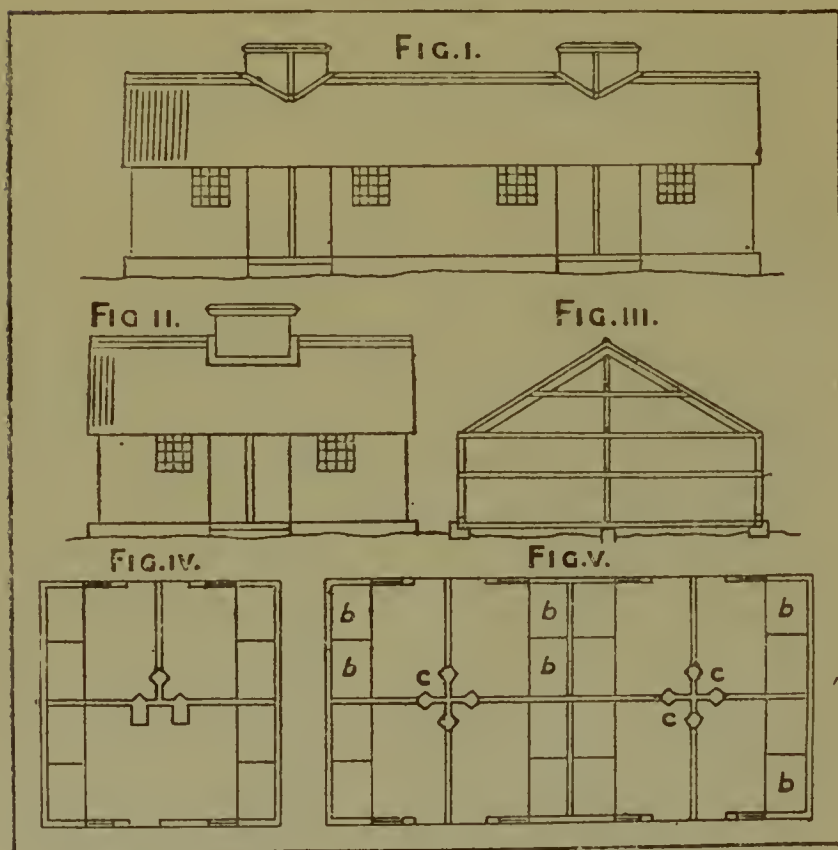
IN the matter of the house accommodation provided for the workers on these stations there has been much less uniformity than in the construction of wharves. All curers, however, appear to be agreed that the dwelling-houses should be built on the highest part of the ground, and that their sites should be made as dry as possible. If there is much excavation to be done to bring the station ground to the desired gradient, the sites of the dwelling-houses are usually left at the original elevation, the ground being drained and levelled, and, if the surface is mossy, a hard foundation is laid to keep the floors dry.

Some curers run a row of single-room huts across the upper side of their ground. In other cases there may be found substantial two-storey wooden buildings of double width, with eight rooms above and eight below. The principal objections to a house of this design are that it is likely to be too noisy for comfort, and that the upper rooms are less convenient for the storage of stock left over at the end of the season than rooms on the ground flat. In addition, these houses are often built in exposed situations, and a low building is less likely to be damaged in very stormy weather than a high one.

**WOMEN'S HOUSE.**—Plan B shows plans of houses that have been growing in favour with curers of recent years. Fig. I. shows the front elevation, and fig. V. the ground plan, of a dwelling-house for women, with accommodation for sixteen crews. The house is double, with four rooms on each side, and fitted to accommodate six women in each room. The walls are made of good seven-eighths ploughed wood, stoutly nailed upon a framing of battens 6 inches by 2 inches. There is a substantial  $1\frac{1}{2}$ -inch flooring, resting upon 6-inch by  $2\frac{1}{2}$ -inch sleepers. The roof is of wood,

covered with corrugated iron. The chimneys are of brick, each room having a separate vent (fig. V. *c*), otherwise the house would probably be smoky. The partitions between the rooms are of seven-eighths ploughed lining. In each room there are two large beds made of strong deals, as shown at *b*, fig. V. Round the eaves there are heavy gut-

### PLAN B.



ters, with barrels at each gable to catch the rain water, as water is often scarce and not of the best quality. Fig. III. shows the framing of the gable. If the pitch of the roof is fairly high, a room 14 feet by 12 feet, with 9 feet of a side wall, may give the necessary space of 400 cubic feet for each person occupying the room. A room 14 feet square with a 9-foot wall will certainly be large enough.

COOPERS' HOUSE.—Figs. II. and IV. show the front elevation and the ground plan of a smaller house intended for the accommodation of the coopers. It is half the size of



the women's house, and is usually divided into three rooms. A large room for the coopers occupies one-half of the building. The other half is divided in the same way as the women's house, one room being fitted up as an office and bedroom for the manager, and the other being the house-keeper's room. Fig. III. shows the framing of the gable for both houses. Closets are generally erected at the seawall, on each side of the wharf, one closet being required for every twenty-five workers of either sex.

FARLAND SHEDS.—Salt cellars are not much in evidence at these out-stations, the salt being almost invariably put into barrels as it is discharged. Farland sheds are, however, of great service, and the wonder is that they are not universally used. Only a roof set upon stout posts is required, the roof extending 3 feet or 4 feet beyond the farlands on either side. With a double line of rails, such as were described in Chapter V. and shown on plan A, the farland sheds would be erected about the middle of the station, on each side of the rails. The women would stand, when gutting, at the outside of the farlands—*i.e.*, the sides farthest from the rails. The rails, with the sides of the farlands nearest to them, would thus be left clear for the fishermen when discharging herrings. Wooden shoots (referred to in Chapter III.) may be arranged to run the herrings across the farlands to the women's hands, and so save shovelling. In this instance, these shoots may be quite narrow, as only one basket is emptied at a time.

COST.—One approaches with considerable diffidence the question of the cost of a station such as has been described. The amount of excavation necessary, and the nature of the ground to be excavated; the depth of the water and consequent length of the wharf; the quality of the material used in the construction of the wharf and houses; and the thickness and strength of the retaining wall, will all be important factors in the bill of costs. The dwelling-house for women described might cost from £160 to £180, and the coopers' house half that sum. When wharves were lighter in construction they used to cost about 20s. per lineal foot, but at present, with the extra weight and cost of material, they cannot be quoted below 30s., or perhaps more. A landing-stage of 100 feet in length might, therefore, be estimated at £150; or, for 150 feet, £220. A concrete retaining wall, 200 feet long, 11 feet or 12 feet high, and 2 feet thick at the top, by  $3\frac{1}{2}$  feet or 4 feet at the foundation, would cost about £100 or more. Two farland sheds, one on each side of the rails, might cost £25 to £30

each. These might be 50 feet long by 14 feet broad, and would simply be roofs of corrugated iron, or wood covered by felt, set upon posts 7 feet high, with gables planked over, but both sides open. Rails, trolleys, and closets would be other items, besides the cost of excavating and levelling the ground. The latter would depend entirely upon the nature of the site. It might cost very little beyond the removal of the surface turf and the laying of a good bed of stones and gravel, or it might cost several hundred pounds, if much quarrying and excavating had to be done. As mentioned before, where the shores are high the water is generally deep, so what is saved off excavating has usually to be spent on a landing-stage. Where the shores are level, these wharves are frequently 200 feet or more in length. But from the above figures it will be seen that from £600 to £1,000 would be required to construct a curing station such as I have described; and for a larger station, with additional dwelling-houses, etc., the cost might be a good deal more.

## CHAPTER VII.

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### MEN'S AND WOMEN'S WAGES IN THE SCOTCH TRADE.

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#### THE YARMOUTH HERRING FISHING.

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COOPERS' WAGES.—BARREL MAKING.—Before machinery was introduced the standard rate for barrel making in Scotland, when trade was good, was about 1s. per barrel—seldom much more or less. The introduction of machinery has brought about certain changes and modifications. Most curers now get their ends dressed by machinery, and pay the coopers 1d. per barrel less on this account. In some cases the staves are also dressed by machinery, which entails a further reduction in the rate, generally to 6d. per barrel. As the coopers are able to turn out more barrels per week, however, their gross earnings are not affected. In steam factories everything is done by machinery except the hooping of the barrels; and for this part of the work 3d. per barrel is considered fairly good wages.

One important point has to be kept in mind here, however. By the introduction of Swedish spruce staves instead of the harder and rougher varieties of wood formerly used, and the substitution of iron for wooden hoops, barrel making is now very much easier than it was. It is generally admitted that five barrels can nowadays be made as easily as four could have been twenty-five years ago; therefore, when trade is good, a cooper may now easily earn 25 per cent. more than under the old conditions.

COOPERS' WAGES DURING THE FISHING SEASON.—For a number of years coopers have been paid from 35s. to 40s. per week during the fishing season at the principal Scotch stations. When going from home all travelling expenses are paid in addition. If no lodgings are available within a reasonable distance of the curing yard, the curer usually provides a house and pays a housekeeper's wages; the men then bearing an equal share of the housekeeping expenses.

This is the usual arrangement at out-stations in Shetland and the Hebrides.

**WOMEN'S WAGES.**—Women's wages vary a good deal. The usual rate per barrel gutted and packed is 8d., with 3d. an hour for all other work; but there are always substantial items in addition. At the East Coast stations a retaining fee known as "arles" is usually paid to each woman. It may range from £1 to £4, according to the length of the season, the demand for female labour, and the experience and skill of the worker. Women going to work at out-stations get, in addition to the ordinary rates per barrel and per hour, their travelling expenses, lodgings, and fuel; and, instead of "arles," usually a weekly wage of about 8s. Other terms are, of course, frequently agreed to; but, on the whole, payment partly by fixed wages and partly by results seems to give most general satisfaction. When neither arles nor weekly wages are paid women look for 1s. per barrel.

On the East Coast of Scotland, of recent years, the demand for female labour has been so great that not only have the Hebrides been drawn upon for workers, but Irish and even Swedish women have been brought over for the great summer fishing.

**CURING EXPENSES.**—Curing expenses include the price of the barrel and salt, men and women's wages, harbour dues and carting, rent and taxes, and sundries, such as hoops, rushes, knives, tacks, lamps, oil, etc. As a rule, it takes from 7s. 6d. to 8s. to cure a barrel of herrings, but these figures are generally exceeded at the out-stations, owing to the expense of transferring stock and workers. Working expenses are, of course, least when coopers and women can be kept fully employed, and greatest when there is little or nothing for them to do.

**YARMOUTH AND LOWESTOFT HERRING FISHING.**—Although the Yarmouth herring fishery is a very ancient industry, curing in pickle for the Continental markets is a comparatively recent development of the business on the Norfolk and Suffolk coasts. At no other stations in Britain, however, has there been such rapid and steady extension of the business as at Yarmouth and Lowestoft. The fact that the East Anglian fishing season comes on after the close of all the principal Scotch fishings has attracted Scotch curers, with their experience and energy, their skilled workers, their capital, and their stock. At Yarmouth and Lowestoft the pickling trade is almost entirely in the hands of the Scotch curers. The English buyers

give their attention mostly to the fresh trade, both with the home markets and with Germany, and to the curing of bloaters and kippers.

One or two points of difference between the Scotch and East Anglian fishings may be worth noticing. In the Moray Firth and along the East Coast of Scotland generally, rough, dark nights are always best for fishing; but on the Norfolk and Suffolk coasts the best results are usually obtained on clear moonlight nights. Then, on the Scotch coast the herrings appear to have deserted their old haunts on the inshore grounds, and fishermen have had to go farther and farther to seaward for them every year—often 80 to 100 miles or more. The English fishing, on the other hand, is got in a comparatively small area, and usually on the same ground year after year. The fishing generally starts to the north of Yarmouth, and draws southward as the season advances; but occasionally this order is reversed. To judge by the enormous quantities landed at Yarmouth and Lowestoft in a good season, the number of herrings congregated on the small fishing area must be incalculable.

The Scotch cran has now almost entirely superseded the old system of selling by count on the English coast. In Lowestoft, however, after the herrings have been sold by sample, the buyer provides kits or barrels into which to discharge them; whereas in Yarmouth the fish are generally discharged into swills provided by the salesmen, and, on account of the expense incurred in keeping up these swills, the Yarmouth salesmen give no discount to the buyers.

Scotch curers who have tried both stations say that the work is much easier in Yarmouth than in Lowestoft. At the former station the carts are low, and can be loaded quickly and easily. Much time and labour are thus saved when discharging fresh herrings or shipping cured stuff. In Lowestoft, on the other hand, the carts are very high, to suit the high platform of the market, and the work is thus heavier.

A larger staff of workers is required than on the Scotch coast. The landing frontage is very extensive, especially at Yarmouth, and this necessitates more men to attend to the discharging of the herrings. Then, on account of the keen demand for herrings for the fresh markets, prices are often so high that curers are compelled to stop buying for days, perhaps for weeks. When, therefore, a big supply brings prices down to a figure that they can afford to



pay, curers must be prepared to buy a large quantity, in order to make up for lost time, and this means the employment of a greater number of women than would be considered necessary at a Scotch station.

The curing is done after the Scotch method, and the selections are made upon the lines of the Scotch Fishery Board's Regulations; but there are practically only three selections—full, matfull, and mattie. Few spent are got at this fishing.

Second Fishery Liverpool salt is almost universally used. It is mostly brought by rail, and costs about 23s. per ton delivered.

Russia provides the great outlet for the herrings cured at Yarmouth and Lowestoft. In the German markets the Dutch are successfully maintaining their long-standing connection, and as they are generally prepared to accept somewhat lower rates than the British, the latter have found it more profitable to exploit the Russian markets.

Coopers' wages at Yarmouth and Lowestoft are much the same as in Scotland, and the women get the usual Scotch rates of 8d. per barrel gutted and packed, and 3d. an hour for filling up, etc. As a rule, however, no "arles" are paid for the English fishing. The women receive instead a weekly wage of 8s. or 10s., inclusive of lodging allowance. As travelling expenses amount to £2 5s. to £3 for each man and woman, or even more for very long journeys, and the bill for stock freights is usually a goodly sum, curing expenses are very heavy. In an ordinary season they may be safely calculated at 10s. per barrel cured.

## CHAPTER VIII.

### A KIPPERING HOUSE.

FOR the erection of a kippering establishment little more space is absolutely necessary than a site for the buildings. If it is available, however, it is an advantage to have in addition a small yard, at least large enough for a cart or lorry to turn in and be loaded or unloaded, and with room in the corners for storing empty fish boxes, barrels, or kits, and for the accommodation of the offal barrels. A piece of ground about 100 feet long by 60 feet broad would give ample room for the necessary buildings and these other requirements, and a few barrels of herrings might be gutted and packed in it, too, in an emergency.

Plan 1 (page 36) shows the ground plan of a kippering house situated in a small yard of the above dimensions, fronting the street at A. A wall or fence of rough  $\frac{3}{4}$ -inch boarding 8 feet high (C) surrounds the yard, and separates it from the adjoining property (B). The ground floor of the fish house and shed should be of concrete, pavement, or brick, and the floor of the kilns must be of brick, as concrete would be damaged by the heat of the fires. The fish house or splitting shed (D) is 42 feet long by 25 feet wide and 10 feet high. Its floor slopes gently inwards to about two-thirds of its breadth, where it is well drained, trapped, and ventilated, and connected with the public sewer.

E shows the plan of the kilns, of which there are five, of two voids each. Each kiln is 18 feet by 8 feet, with brick division walls (G) 7 feet high, and wooden partitions extending from the top of the brick walls up to the roof. F is a packing shed behind the kilns. It is 42 feet long by 16 feet wide and 10 feet high. As F will only occasionally be used as a packing shed, the inner end of it may usually be utilised as a chip store. A bench (H) about 42 feet long by 2 feet 9 inches broad occupies the whole front of the fish house. This bench is about 3 feet high, and in



front of it wooden gratings should be laid for the splitters to stand on. These platforms should be so made as to nullify the slope of the floor and provide a level footing for the workers. K shows the yard gate, L a large sliding door for the fish house (D), and M a smaller door for the store (F). The position and arrangement of the kiln doors is shown at N in the fish house (D), and similar doors open into the store (F). A stairway (O) leads up from the inner end of the fish house to the packing loft above, a similar stair leading up at P in store (F).

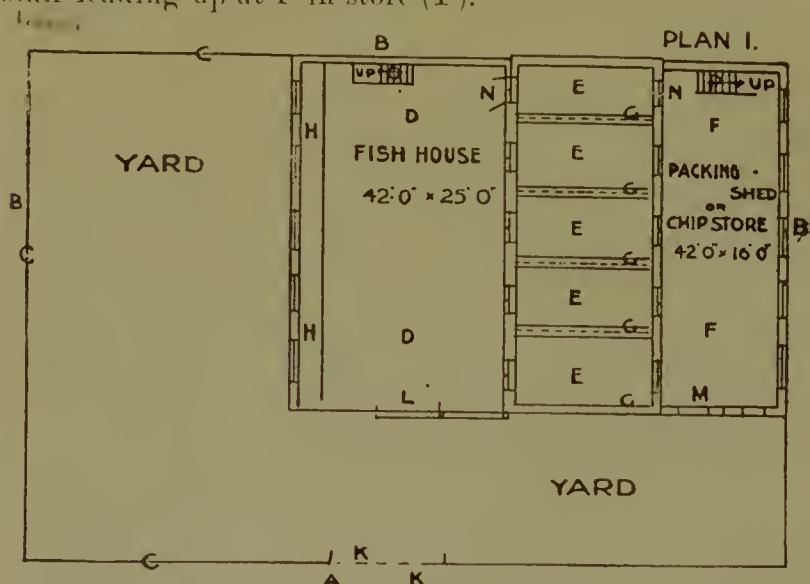
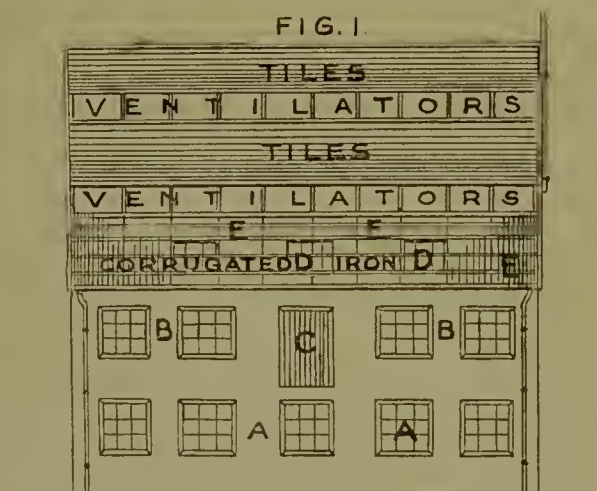
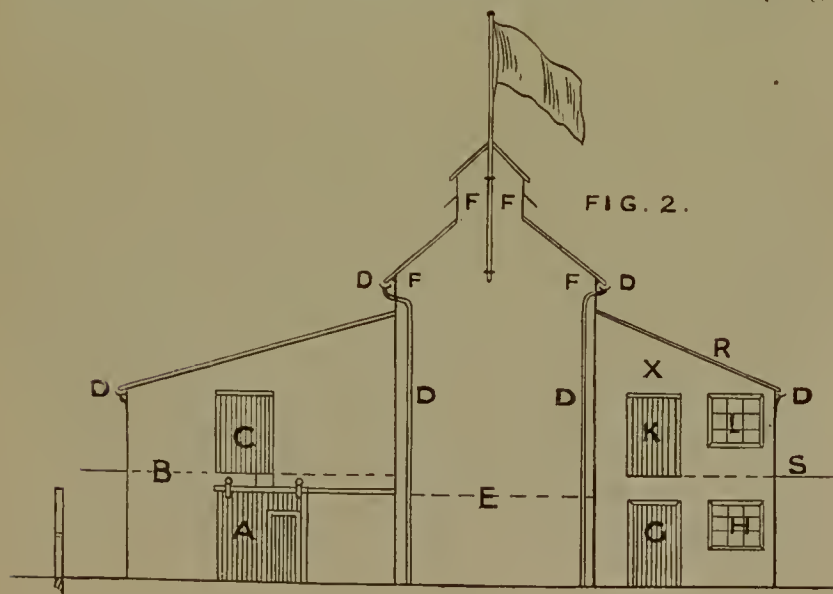


Fig. 1 (page 37) shows the front elevation of the building. Five windows (A), at a convenient height for the splitters' bench, give light to the fish house. The packing loft above has a door (C) in the centre, and two windows (B) on each side of the door. Benches similar in height and breadth to the bench in the fish house run along the front of the loft, on each side of the door. Upon these benches the kipper boxes are made, and, when full, are nailed up. The door C is used for passing in box wood and passing out boxes of kippers. The latter could be slid down a shoot; the former would have to be handed or thrown up from the cart. This packing house is exactly the same size as the fish house below, and in it most of the packing and box-making would have to be done. Its roof (E) is of corrugated iron, and it should have three skylight windows (D), each 4 feet by 4 feet. The kiln is roofed with tiles or corrugated iron, and ventilated as shown on fig. 2 (F) (page 37).

Fig. 2 shows the end elevation of the building. The door of the fish house is shown at A, a sliding door large enough to admit a cart or lorry, but with a wicket gate in it for ordinary traffic. B shows the position of the loft front floor, and C a door at the end of the packing



loft. In working this loft it would probably be found most convenient to take in all the box wood at this door and store it immediately inside it, while the bulk of the kippers would be passed out at the front door (fig. 1, C), which, being in the centre of the loft, would entail less carrying.



The position of the top of the brick walls which divide the kilns is shown at E, and the position of the ventilators at F. G and H show the positions of the door and window in the store behind the kiln, and K and L the door and window in the loft above, which would also have three skylight windows in the roof, the same as in the roof of the front loft. With buildings of this size it should be possible to kipper 60 or 70 crans a day, but if a smaller business were contemplated—say, 40 to 50 crans—the back loft (X) would not be required, and the roof (R) would rise from S. The gutters and conductors from the roof of the kiln and lofts are indicated at D.

**SPLITTING.**—The process of splitting is generally done by women, and may be thus described:—A woman stands facing the bench, with an empty barrel for offal at her left side (but mostly under the bench) and a small basket behind the barrel. Lifting a herring with her left hand, she brings its head towards her and its back towards her right hand, in which she holds a kippering knife. Pressing the palm of her left hand down upon the herring to keep it in position, she enters the knife about the middle of the fish, just above the bone, taking care not to run the blade out through the belly of the fish. First she draws the knife up to, but not through, the upper lip; then she reverses the blade and runs it down near, but not through, the tail, keeping the knife running close along the bone. With her left hand she now opens the fish, and with the knife and the thumb of her right hand she removes the gills and viscera, which are slipped into the offal barrel, while with the left hand the split herring is dropped into the basket. Care should be taken to remove the silvery gland known as the *sound* along with the rest of the offal, otherwise the appearance of the finished kipper will suffer from its presence.

**WASHING.**—The wash-tub should be placed near a water tap and cesspool, and a short indiarubber hose should lead the water into the tub. When herrings are being washed, a constant flow of water should be allowed to run into the tub, near the upper edge of which, and opposite the side where the washer stands, there should be a large bunghole to allow the overflow water to escape. A man carries the split herrings from the bench to the wash-tub, leaving an empty basket in place of the full one he removes. A wide, shallow basket is kept floating in the wash-tub, and into this each small basket of herrings is emptied. The washer then grasps the washing basket by the handles, and gives it a few rapid turns to right and left to rinse the herrings

thoroughly, but taking care not to leave them too long in the water. After this he lifts the washing basket on the edge of the tub, and leaves it for a few seconds until the water drains from the herrings, which are then emptied into a carrying basket. A quarter-cran basket is a useful size for this purpose.

PICKLING.—The making of pickle has already been described in Chapter IV. For pickling kippers large vats or tanks should be used. A convenient size would be 6 feet long by 3 feet wide by 2 feet 9 inches or 3 feet deep, and three or four of these would be required. The time allowed for pickling the herrings should depend to some extent upon the state of the weather and the season of the year. Soft herrings require longer time in pickle than firm fish, and certain markets require more salt than others. Half-an-hour may, however, be taken as a fair average time.

When sufficient herrings have been emptied from the carrying baskets into the pickling vat, the fish on the top should be spread out, back up, and freely sprinkled over with salt. This salt assists in curing the herrings on the top, and helps to keep up the strength of the pickle. Pickle for kippers may be used repeatedly, but not so often in summer as in winter. On account of the heat of the atmosphere and the fatty nature of summer herrings, pickle turns sooner stale and sour in summer than in winter. The strength of the pickle, however, should be tested regularly, with a salimeter if possible, and salt added as required.

TROUGHS.—Half-a-dozen troughs will be required, each 3 feet 6 inches long by 11 inches or 12 inches deep by  $1\frac{1}{2}$  feet to 2 feet wide, fixed upon upright supports, each with a notch at the top for holding a tenter. The upper edge of the trough should be about 3 feet high, and the tops of the supports 14 inches or 15 inches higher. The trough should be tight, so that no pickle could leak through, but it should be fitted with a false bottom—a wooden grating laid on the bottom, which would help to drain off any pickle adhering to the herrings.

The tenters are wooden bars 4 feet long by  $1\frac{1}{2}$  inch by 1 inch. There are sixteen tenter hooks on each side of the bar, so that a tenter will hold eight herrings on each side. The hooks are in pairs  $3\frac{1}{4}$  inches or  $3\frac{1}{2}$  inches apart, according to the size of the herrings likely to be got, and about  $1\frac{1}{2}$  inches between each pair of hooks. From 5,000 to 6,000 tenters would be required for a kiln of the above dimensions.

There are usually a few young girls as learners in a kippering establishment, and when the first herrings have been drawn from the pickle these learners commence to put them on the hooks. Two girls (or four) stand on opposite sides of a troughful of herrings; they lay a tenter along the tops of the uprights, and lifting the herrings from the trough they hang each upon a pair of hooks, the back of the fish being towards the wood, and the hooks piercing the herrings below the lug bones.

A pair of racks are placed inside the kiln in which the first herrings are to be hung, and upon these racks the full tenters are now laid. When the racks are full the smoker and his assistants commence to hang the herrings up in the kiln. Care must be taken when hanging the herrings to place each full tenter directly above the one below it. The uprights or standards upon which are fixed the stringers or framing upon which the tenters are placed in the kiln will help the smoker to judge his distances: he will see how many tenters he can place comfortably between each pair of uprights. After the kiln is full the smoker may easily see if the hanging has been properly done by looking up through the kiln from below. There should be a small clear space right up between each pair of tenters, tier after tier, to allow the steam and smoke to go up freely.

With a few learners tentering from the commencement of the day's work, at least one kiln should be filled and the fires set agoing before the splitting is finished. After that the rest of the women should be turned on to the tentering, when the full tenters will have to be taken straight from the troughs to the kiln, and the smoker and his assistants will be kept busy hanging until all the herrings are worked up.

**RACKS.**—The racks referred to above are 7 feet long by  $5\frac{1}{2}$  feet high, with five rails 8 inches apart. Upon these the tenters with the newly smoked kippers are placed when they are taken from the kiln to allow the fish to cool. From a dozen to a score of racks should be provided, the greater part of them to be kept in the packing loft, and the rest divided between the fish house and the store F (Plan 1—see page 36) behind the kilns.

**SMOKING.**—A great deal depends upon the man who is in charge of the smoking. Often through the want of experience and knowledge on a smoker's part a houseful of valuable fish may be scalded and lost. For smoking purposes oak chips and oak sawdust are considered best, both for colouring and flavouring. Generally six small fires



are lighted in each kiln, three under each void. The fuel consists of a small heap of chips covered over with a layer of sawdust. The smoker in charge should know by experience the quantity of sawdust necessary for the kind of chips used, and for the ventilation of the kiln; but he should watch carefully lest the fires should burn up too quickly and give off too much heat. A little additional sawdust will keep the flames down. The smoker must also watch how the kilns vent. With different directions of the wind different results may be experienced. Sometimes the kilns will draw up at one end and not at the other. It would then be the smoker's duty to open, or partly open, the doors at the side where the kilns are drawing well, so as to send the draught back to the other side, and give all the herrings in the kiln a fair share of the smoke and heat.

The first fire being burnt off, another has to be laid, when, as a rule, a little more sawdust has to be used than for the first fire, as less heat will now be needed. Without a certain amount of heat herrings will not take on a proper colour, but if the kilns should be overheated the fish will be scalded, and fall off the hooks. Generally, therefore, after the first fire, less heat and more smoke should be aimed at.

When the second fire has burned off it will generally be found that the herrings upon a few of the lower stringers in the kiln are sufficiently smoked, and may be taken down and set upon racks to cool. This will probably happen at night, when only one man, or at most two, will be attending to the kiln. It would then be most convenient to have the racks set on the ground floor, either in the store F (Plan 1—see page 36) or in the fish house, which would now be empty. Before applying another fire the smoker should try to judge what strength of a fire would be required to complete the smoking without overdoing it, and regulate the quantity of fuel accordingly.

When the third fire has burned off, a good many of the herrings in the lower part of the kiln will be found to be ready. These also should be removed and set upon racks in the packing loft, and fires should be applied until the remaining herrings are also ready to be taken down. Any herrings that are not ready when the packers commence their work in the morning are left hanging in the kilns, and allowed to cool there after the fires have burnt out.

A capable smoker should be able to take his kippers all out about one colour. This may often be difficult, but it

should not be impossible if he studies his kiln carefully and profits by his experience.

**PACKING.**—Before commencing to pack, the herrings must be allowed to hang on the racks long enough to cool thoroughly, otherwise they are apt to sweat, and arrive at the market in bad condition. But with the night staff stripping the kilns as fast as the herrings are ready during the night, there should be plenty of cooled herrings ready for packing by the time the women arrive to commence work in the morning. It is at this stage that the packing stools prove useful, as they can be placed near the racks where the kippers are hanging. This saves carrying each tenter to the bench, and allows the work to go on quietly and methodically. Placing an empty kipper box on the stool, a women lifts a tenter of herrings from the rack with her left hand, and with her right hand she takes off a pair of herrings—one from each side of the tenter—bringing them face to face as she takes them off the hooks on which the herrings are hanging back to back. Each pair of herrings is placed in the box as they are taken off the tenters, the first tier being laid across the box with the heads of the fish all to the same side. When the tier is complete, two pairs, with their heads towards opposite ends of the box, are laid across the tails of the first tier. The second tier is laid in the same way as the first, except that the heads of the herrings are laid the opposite way; two pairs are again crossed over the tails, and so on till the box is filled. Each box, as soon as it is filled, is carried from the packing stool to the bench, where it is covered with a sheet of paper, and the lid is nailed over it.

**SELECTION.**—During the packing all broken or otherwise defective herrings are selected out, to be afterwards packed by themselves as “seconds.” A basket to hold the “seconds” should be set near each packer.

**NUMBER.**—The number of kippers in a box will, of course, depend upon the size of the fish. As a rule, the box should hold from sixty to seventy medium-sized herrings, but if the fish were very large, four dozen might fill the box.

**WEIGHT.**—Some curers *weigh* each box, especially for exportation to the Colonies, in which case 14 lbs. of kippers are, as a rule, put into each box.

**BOXMAKING AND MARKING.**—The boxes always have the curer's name stencilled on them when they are made; often the ends are so stencilled before they leave the sawmill. The wood, it is scarcely necessary to say, is cut at the mill to



FIG. I.

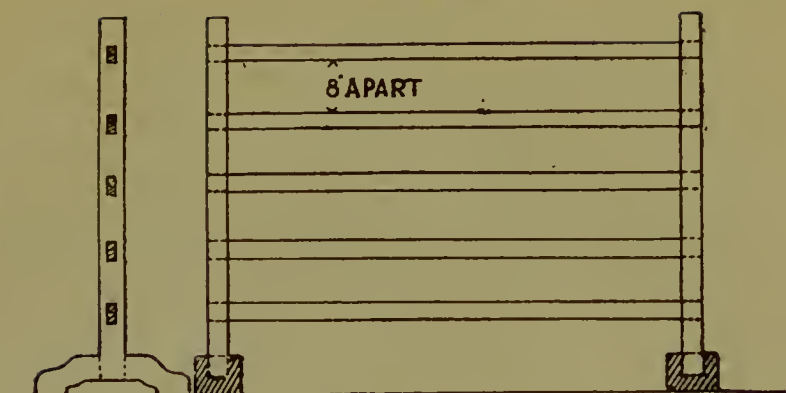


FIG. II.  
TROUGH

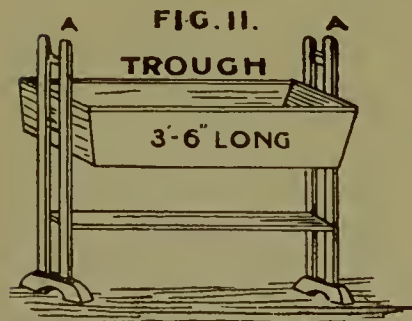


FIG. III.

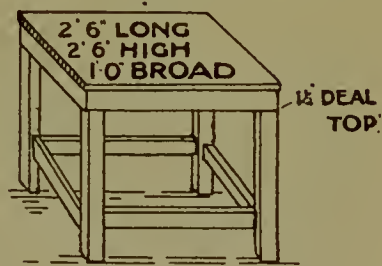
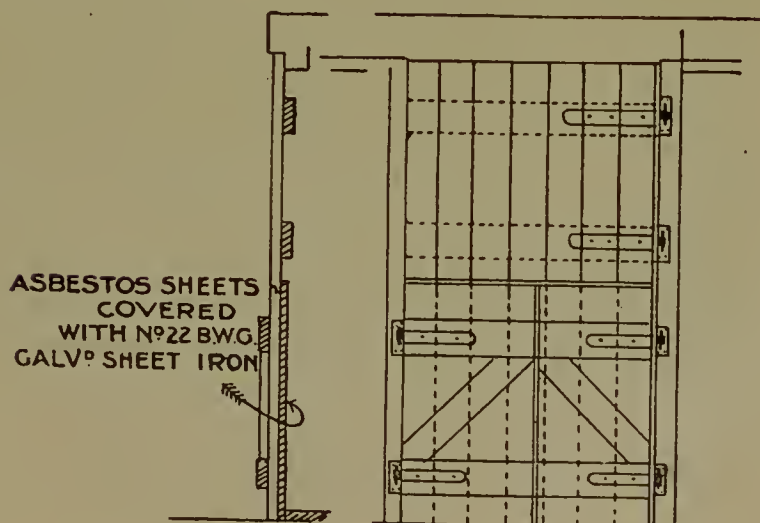


FIG. IV.



the exact sizes necessary for the various parts of the boxes. These are made in the packing loft in spare time, and a wise curer will aim at having a fair stock made and stored away about his premises, to be ready for emergencies.

GLASGOW TRADE.—For a special-customer trade in Glasgow, kippers are sometimes cured rather differently from the fish intended for the English markets. Large herrings are preferred. They are split in the usual way, but, instead of being merely rinsed through water in a basket, each fish is taken in hand singly and carefully washed before being put into the pickle. The fuel used in the kiln is mostly white-wood chips and sawdust, the object being to avoid giving the kippers too much colour. This is a slower and more expensive process than the ordinary method of cure, and, consequently, curers do not care to spend time over it unless they have a fair prospect of higher prices for the kippers.

COST.—A kippering establishment such as has been described, with the addition of a w.c. for each sex, would cost upwards of £500, perhaps £520 to £550. The plant required—pickle vats, wash-tub, troughs, packing stools, racks, tenters, baskets, etc.—would bring the price up to £600, apart from the price of stock, under which heading might be classed salt, boxes, and fuel.

The sketches on page 43 show some of the plant referred to. Fig. I. is a drawing of a rack, 7 feet long by  $5\frac{1}{2}$  feet high, with five rails 8 inches apart. Fig. II. gives a representation of a trough, showing the notches at A, across which the tenters are laid when the herrings are being tentered. Instead of the double uprights, however, single strong supports, with notches at the top, are generally used. Fig. III. shows a packing stool, which explains itself. Fig. IV. shows the construction of a kiln door. It is made in two parts, divided horizontally, the upper half being in one piece. The lower half again is subdivided perpendicularly, and hinged so that either half may be opened at will. This arrangement is necessary to regulate the ventilation of the kiln. The lower halves are lined with asbestos sheets, covered with No. 22 Birmingham wire gauge galvanised sheet-iron, to protect them from the fire.

## CHAPTER IX.

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### HOW TO MAKE BLOATERS AND RED HERRINGS.

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THE bloater trade is more an English than a Scotch industry. Scotch curers, and also English firms doing a smoking business in Scotland, confine their attention principally to the kippering business. The making of bloaters is, however, a simpler and less elaborate process than the making of kippers.

**SALTING.**—If fresh herrings have to be dealt with, the usual method of curing is to rouse them well with dry salt upon a brick or pavement floor, turning them over with a wooden shovel during the process of salting, and leaving them overnight in the salt. In the morning they are washed through light pickle, and hung on spits or tenters.

**HANGING.**—Spits, it may be as well to say, are rounded wooden rods, 4 feet long, about the thickness of a man's finger, and sharpened at one end. As the wood is apt to get blunted, tin cones with sharp points are often fixed upon the points of the spits during the process of spitting. Occasionally iron rods are used for spits, and these are much thinner than the wooden ones. To spit herrings, either for bloaters or reds, enter the sharp end of the spit below the gill cover of the fish, and push it out through the mouth. Hang the spits in the kiln—an ordinary kipper kiln—in the same way as the tenters of kippers.

**PICKLING.**—Curers who make preparations for doing a large business in bloaters usually have vats or tanks, large enough to contain great quantities of fish, constructed on their premises—sometimes below the floors of their stores. When herrings are plentiful and cheap, these vats are filled with roused herrings (usually sea-salted), which are then floated in pickle, and afterwards drawn out and smoked at the curer's convenience. A regular supply is thus assured for a considerable time, even although prices of fresh herrings should rise or the fishing come to an end.

**SMOKING.**—Bloaters are smoked in much the same way as kippers, but a fire of hard wood billets is usually preferred to chips and sawdust. The soft fuel gives rather more colour than is desirable, as bloaters should be *dried* rather than coloured in the smoke. Eight hours' light smoking will generally make the fish ready for market.

**PACKING.**—Bloaters are packed across the box with heads all to one side till the tier is complete; then two or four herrings with their heads to opposite ends of the box are laid lengthwise across the tails of the fish in the tier. The second tier is packed across the box like the first, but with the heads of the fish to the opposite side of the box—that is, over the tails of the fish in the lower tier. Herrings are laid over the tails of the fish again, and so on till the box is full.

**A SMALL KILN.**—The fishmonger who may be left with a balance of fresh herrings unsold—or anyone who wishes to prepare a few dozen bloaters—may, instead of dry-salting, immerse the herrings in strong clean pickle, and leave them in it overnight. In the morning the fish will be ready for hanging. It should be distinctly understood that the smoking of fish does not depend upon the size of the kiln. All round the Scotch coast, for instance, there may be seen small smoke-houses, in which the fishermen's wives smoke haddocks to perfection. They are generally rough wooden buildings, often put together by the fishermen themselves, perhaps 4 feet square and 6 feet or 7 feet high, with bars at opposite sides and suitable intervals for supporting the spits or tenters. Dwarf walls of stones or clay inside may protect the wooden walls from the fire. Even a large cask, with both ends out and a few holes bored in each quarter for ventilation, may be converted into a kiln fit to smoke a few dozen bloaters. In this case it is necessary to put the fire in an iron vessel, and to spread a sack or other heavy covering over the cask during the process of smoking.

### Red Herrings.

The trade in red herrings was formerly of much larger dimensions than it is now. To realise this, one has only to look at the large substantial stone and lime buildings which may be seen in any East Coast of Scotland town, originally built and utilised for the curing of red herrings, but now either used for some other purpose or standing vacant.

Powerful steam fishing vessels that can keep the sea in almost any weather, and rapid railway and steamer communication between the principal fishing stations and markets, distribute such a regular supply of fresh fish all over the kingdom that there is a much smaller demand for hard-cured goods in Great Britain than there used to be. A few thousand barrels of herrings are, however, still annually manufactured into "reds," and the business is worth the attention of those who have the time and convenience for it. A brief description of the method of cure may, therefore, not be out of place.

**CURING.**—Rouse the herrings well and pack them into barrels, with plenty of salt about them, the fish being packed much flatter than herrings cured for exportation to the Continent. Herrings intended for "reds" are not gutted, although gutted herrings are occasionally smoked as an after-thought. After standing on end for two or three days the barrels should be filled up, tighted, and laid down. They should be allowed to lie on their sides for at least ten days—some curers prefer to leave them six weeks or more—care being taken to keep the herrings well pickled.

The curing might also be done in the close tanks referred to in the notes on bloaters curing. In this case the herrings should be well roused on a floor, and turned over, during the process of rousing, with a wooden shovel; then, when being put into the tanks, salt should be thrown over them freely, and strong pickle afterwards poured in till the herrings are afloat. Curing in barrels is, however, the more satisfactory method.

**STEEPING.**—When the herrings are sufficiently cured they should be taken out and spitted in the same way as bloaters, the sharp end of the spit being entered under the gill covers and pushed out through the mouths of the fish. After this the herrings have to be steeped in water to extract some of the salt. The "steeps" used are generally long, shallow vats, about 4 feet wide. Across these the full spits are spread, the "steeps" are filled with water, and the herrings left to soak for a night. In the morning the water should be drained off, and the vats refilled with fresh water.

**DRYING.**—After the herrings have been soaking for about thirty-six hours they should be removed from the water. If the weather be favourable the spits should be spread upon racks in the open air to allow the herrings to dry in the wind, after which they should be hung up in



the kiln to be smoked. Should the weather be wet or otherwise unfavourable for outside drying, the fish would have to be hung up in the kiln at once after removal from the steeps, but in that case they would have to be allowed to "drip" for some time before the fires were applied.

**SMOKING.**—The smoking is usually done nowadays in modern kipper kilns. The herrings should first get the smoke from a small billet-wood fire for one night, and then be allowed to cool all the next day and night. The following day and night another billet-wood fire should be applied, and the fish then allowed to cool again for twenty-four hours. Afterwards fires of chips and sawdust should be burned, the fish being smoked and cooled alternately till the required colour and firmness have been obtained. It might take from three to six weeks, according to the requirements of the market for which they were destined, before the fish were satisfactorily smoked.

**PACKING.**—When red herrings are put into small boxes they are packed in the same way as bloaters, the tiers being laid *across* the box, with four herrings lengthwise over the tails of each tier. To pack into barrels commence with the heads to the side of the barrel, and pack the herrings on their sides till the opposite side of the barrel is reached, when about a third of the bottom of the barrel should be covered. Commence again with the heads to the side of the barrel, but so that the tails of the herrings previously packed will be completely covered, and pack as before till the opposite side of the barrel is once more reached. Begin again with the heads to the side of the barrel, and work across till the tier is finished. Repeat this process tier after tier till the barrel is full. The red-herring barrel is a wooden-hooped, dry-ware cask, like the barrels in which all the smoked haddocks used at one time to be conveyed to market, and there should be from twenty to twenty-five fair-sized herrings in each tier. The packing should be *flat*; that is, the herrings should be laid on their sides, both in barrels and in boxes. It is scarcely necessary to say that the fish ought to be allowed to cool thoroughly before being packed, otherwise they will deteriorate.

## CHAPTER X.

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### HERRING CURING ON THE CONTINENT.

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#### Dutch Herring Fishing.

THE Dutch have the credit of being the pioneers of the North Sea herring fishing. They caught and cured herrings long before the British, and, although their methods of capture and curing may have improved, they have not materially altered for centuries. Along with a number of smart ketches, and a few steam vessels of a larger size and tonnage than a British steam-drifter, they still send out a great many of their old-fashioned bom-vessels, or busses, every summer. These are, however, being out-classed, and will probably all have disappeared and been replaced by more modern craft within ten years, judging by the present rate.

All their curing is done at sea; they gut and pack the herrings as soon as they haul them on board, the fish being kept in "binges" on deck until gutted. Spent herrings are selected by themselves (when plentiful and cheap they are sometimes thrown overboard), and all others are packed promiscuously. As soon as a barrel is packed it is "headed up," slung below, and stowed away in the hold.

On arriving in Holland the fish are sold by auction, usually per seventeen "kantjes." The "kantje" is an oak barrel with wooden hoops, a little shorter but rather wider than, and thus almost equal in capacity to, a Scotch barrel. After being sold, the herrings are either filled up and sent away in the original packing, or selected and repacked into Scotch barrels. The selections are:—Superior, of which there are from 600 to 650 herrings in a barrel; Sortierte, 700 to 750; Prima, 800 to 850; and Small Full, 900 to 1,000. Spent herrings and the few matties the Dutch get are not repacked, but are always filled up and sent to market in the original cure. Dutch barrels, with the original packing, are preferred in Western Germany—Westphalia, Rhineland, etc., but in the middle and the eastern



parts of Germany Scotch barrels are most in favour. Out of seventeen "kantjes" you get thirteen Scotch barrels after repacking. Seventeen "kantjes," sea-packed, are calculated to contain a last of herrings.

The "zinkband" barrel has been growing in popularity in Holland. It is an oak cask, bound with galvanised iron hoops, strong enough to be returned and filled repeatedly. The Germans, who in their methods of fishing and curing have followed closely in the footsteps of the Dutch, use a similar iron-hooped cask, both at sea and on shore. They pack promiscuously at sea, but select and repack all their herrings on shore, making similar selections to those of the Dutch.

### Swedish Herring Fishing.

SEINE NET FISHING.—The Swedes catch most of their herrings in seine nets. These are strong nets, with narrow meshes, which are worked by twelve or fourteen men with two skiffs, the method of fishing being pretty much the same as seine net fishing in the Firth of Clyde. The net is run out in a circle, the ends are brought together, and the lower rope is hauled up, thus enclosing any herrings that may have been surrounded by the net. As the net is hauled aboard one of the boats, the herrings are brought up alongside until they can be scooped up with baskets. The skiffs used are broad, open, strongly-built boats, such as may be seen on board the Swedish vessels which prosecute the long line fishing off the Shetlands during the summer months. The quantity of herrings enclosed by these seine nets is often greater than the pair of skiffs can carry. Generally, however, there are cruising in the vicinity small carrying vessels known as "yachts," whose crews are on the outlook for employment, and the herrings are transferred to these yachts and taken ashore to market. When a loaded yacht is seen approaching, the buyers frequently go out in small steam launches to meet it, and buy the herrings before they are landed. The Swedish seine net fishing was formerly confined to the Skär-gården, a piece of water sheltered by a stretch of islands off Marstrand and neighbourhood; but now it is mostly carried on outside these islands, though at no great distance off. The herrings caught in the seine net are mostly spent.

DRIFT NET FISHING.—A few of the Swedish fishermen still follow the drift net fishing, and although working in

small open boats, with only five nets in each boat, they are not afraid to go long distances to sea. The drift net used in Sweden resembles the British net, and is often of British manufacture. Unlike the seiners, the drift net fishers catch mostly full herrings.

The Swedish fishing generally lasts from December till the beginning of March, but depends very much on the condition of the weather. The presence of ice might bring the season to a premature close. Fishermen prefer to go out and shoot their nets in the early morning and haul after sunrise.

**FRESH HERRING TRADE.**—Most of the Swedish herrings are sent fresh to Germany, the principal markets being Altona, Hamburg, Lübeck, Kiel, and Stettin. They are exported in boxes that contain two hectolitres, or about half a cran of herrings, apart from the ice that is packed along with them.

**HERRING CURING.**—The curing is done after the Scotch method, which was introduced by Scotch firms who went across and carried on business in Sweden for a number of years. The Swedish barrels are made exactly like the Scotch. Most of them are manufactured at Udvalla Barrel Factory. The wood is the same kind and quality as is used in Scotland, and the price of the barrel may be quoted at  $2\frac{1}{2}$  kroner, or scarcely 3s.

As the herrings are nearly all spent, the salting has of necessity to be very light. Spanish salt is mostly used, both for rousing and packing.

The cured herrings go mostly to Libau. The Swedes have lost their hold of the German markets, owing to the irregularity of the fishing. Buyers have so often had to go elsewhere for their supplies, owing to the failure of the Swedish fishing, that they have ceased to depend upon the Swedish cure.

### Norwegian Herring Fishing.

In Norway the herrings are mostly caught in a net known as the "Landvade," which is a big net, one end of which is fastened to the shore and the rest drawn round until it encloses a fjord or bay. Large shoals are often thus enclosed. Occasionally a shoal makes a movement seaward and bursts the net, notwithstanding the fact that it is made of specially strong material. More often, however, the herrings are kept alive in the fjord inside the net for weeks, or even months, the fishermen taking

out the quantity required from time to time. Of recent years the Norwegians have been trying to develop a deep-sea herring fishery in the summer and autumn. The fjord fishing comes on later in the year, like the Scotch "loch" fishing.

**FRESH HERRING TRADE.**—A great many of the Norwegian winter herrings are sent fresh to Hull and Billingsgate, packed in ice in boxes similar to those in which the Swedish herrings are sent to Germany. An extensive kipper trade is done in these Norwegian herrings by British firms.

**CURING.**—An important pickling trade is done in Norway. This curing is carried on under Government supervision, as in Scotland, the barrel having to be a standard size, with either wooden or iron hoops. Norwegian barrels are fully a gallon smaller than the Scotch.

**GUTTING.**—The gut is not so thoroughly taken out by the Norwegians as it is done in Scotland; the throats of the herrings are merely cut with a small pair of scissors, so that the fish are bled rather than gutted.

**PACKING.**—The packing is also different, being loose and flat, and the barrels are not so well filled as the Scotch, the Norwegian cured herrings being left almost floating in the pickle. The herrings contain more fat than milt or roe.

**SELECTION.**—The following marks are put upon the Norwegian barrels:—M., which denotes the smallest size; K., similar to, or a little larger than, the Scotch mattie; K.K., similar in size to a good matfull; and K.K.K., which is the mark for herrings at least as large as the Scotch full.

There is a great outlet in Germany for these Norwegian herrings.

## CHAPTER XI.

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### PILCHARD CURING.

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PILCHARD fishing is, in some respects, the most interesting and picturesque of all our British fisheries. The method of capture has been graphically described by Couch in his "British Fishes," and by other writers. The Cornish coast is the chief seat of the fishery, and the fishing season is the autumn and early winter. Drift nets are used, to some extent, in the open sea, but the pilchard seine is the principal means of capture. It is mostly used near the shore. Like other surface fishes, the approach of a shoal of pilchard can generally be easily discerned by experienced fishermen. Watchmen or "huers" are, therefore, placed at points of vantage along the coast to watch for signs of the approach of the fish, and give intimation to the rest of the fishermen. A change in the colour of the water or the leaping of the fish on the surface may indicate the direction in which the shoal is moving. The object of the fishermen is to intercept and surround the fish with their seine nets, and in this they can be materially assisted by a skilled huer. The pilchards having been successfully surrounded, the lower rope of the net is gathered up in such a way as to enclose the fish, which are then lifted out of the water by means of baskets and loaded into the boats. When the catch has been secured, the fishermen return to port and run their boats upon the beach. As the tide ebbs the fish are scooped up and poured over the side into box hand-barrows, called "gurries," in which they are carried up the beach by labourers and emptied out above high-water mark. Here the fishermen's families—old and young, male and female alike—generally turn out to help the crews to count the pilchards into thousands. The fish are lifted in fours, and 33 fours are counted to the hundred (at some ports only 30), so there are really 1320 fish in a thousand pilchards. An old man is usually told off to

keep tally, a mark being made for every hundred; so "Stroke, grandpa," is a common call on such occasions.

When the fish are all counted, they are sold by public auction, 15s. a thousand being reckoned a fair price for them. The buyer then removes them to his curing premises, where they are first well roused with salt. This is done beside the tank in which they are to be cured. The rousing is done upon a floor. Two men turn the fish over with shovels, and a third throws salt on them—2nd Liverpool or Spanish salt. When they are properly roused, the pilchards are shovelled into the tanks, which are filled quite full, and a layer of salt is spread over the top. They are allowed to lie in these tanks, which are generally large concrete structures, for three weeks. Being then considered sufficiently cured, they are taken out in baskets, to allow the pickle to drain from them. Pilchards are not gutted like herrings. They are simply taken from the pickle and packed into dry casks by women. The packing is flat, and no salt is laid between the tiers. Each cask, when full, is placed under a screw press and subjected to pressure to extract the oil from the fish, the oil escaping through the interstices in the sides and ends of the cask. Pilchards are very fat, and if the oil were left in them they would deteriorate. After undergoing the first pressure the casks have to be filled up, when they are once more put under the press and then headed up for exportation. The oil, as it escapes from the cask, is conveyed to a retaining tank, and it is afterwards filtered before being sold. Most of the cured pilchards are sent by direct steamer from Newlyn to Genoa, where they find a ready market.

For home use pilchards are frequently cured in pickle, like herrings, in which case it is advisable to gut them, to prevent deterioration.

## CHAPTER XII.

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### MACKEREL CURING.

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For curing purposes, only mackerel that are quite fresh should be used, and they should be split, washed, and salted as soon after being landed as possible. Overday's mackerel can never be made into a first-class cured article.

In taking delivery of mackerel care should be taken to have the fish well spread out, so that there shall not be too much weight pressing upon the lower fish. If at all possible, they should be taken straight from the boat inside a shed, especially if the weather be warm, as mackerel spoil very readily.

As the appearance of the fish when finally cured depends greatly upon the splitting, too much attention cannot be given to this important part of the work. To begin with, the knives should be kept in the best of order—as sharp and clean as it is possible to make them. The splitting should be done on a bench of a convenient height to suit the workers—a kippering bench, for instance. Mackerel are split down the back, as close to the bone as possible, and with one stroke of the knife. The fish is laid with its head away from the splitter, who commences at the snout, and runs the knife down above the bone to the tail. The gills and intestines are then removed. After this the fish is ploughed, or “reamed”—that is, a deep slit is made in the thick part of the fish on each side. A vat or tub of clean water should be set within reach, either at the splitter's side or at the opposite side of the bench; and each fish should be dropped into the water after it is “reamed.” Ragged or soft fish should be put aside in the splitting. Some curers prefer to leave the “reaming” of their mackerel until after the mackerel have been steeped in water for some time.

In washing the fish great care ought to be taken to have all traces of blood removed, especially from the bone. Some curers use small brushes for this purpose; others



simply use their hands. Every fish should be carefully handled, and in lifting a split mackerel before the process of cure is completed, it is best to put the hand below the fish, and thus lift without gripping it. The mackerel is so delicate that great care must be taken that the "flesh" is not broken in handling, otherwise it will have a ragged look when cured. Should bones protrude, they should be cut or plucked off. The black skin which lines the stomach, and which is always scrubbed clean off haddocks, cod, etc., when cured, must on no account be broken in the case of the mackerel. As each fish is washed it should be dropped into another vessel of clean water. If possible, a steady stream of water should be allowed to flow through this vessel; failing which, at least three changes of water would be necessary. In the first water the fish should not be allowed to remain longer than a quarter of an hour. So much blood flows from the fish that the water soon becomes dirty, and would discolour them if they were left too long in it. They might be left a little longer in the second water, and in the third they might be left for an hour or longer.

After a short immersion in this second water, the fish should be again carefully lifted, laid upon a clean bench, and covered with loose salt before packing.

As in herring curing, the barrels should first be well soaked with clean water, to ensure tightness and to aid the process of curing. Only new barrels should be used for mackerel curing, and the barrels should be of the best material and workmanship. Barrels which have contained salt beef or have a taint of saltpetre are specially objectionable. Birch barrels are generally preferred, but lately good Swedish spruce has been finding favour with Irish curers. In either case, the best method of hooping is the same—a stout iron hoop on each end, and four wooden hoops on each quarter. Either the best or second quality of fishery salt may be used. Some curers grind the salt fine before using it. The Norwegians prefer Trepani salt on the ground that it makes the cleanest cure.

In packing first cover the bottom of the barrel with salt, then lay the first tier of fish, the heads of the mackerel being put to the sides of the barrel and the skin downwards. When the first tier is laid cover with salt. If there is any vacancy in the centre of the barrel where the tails of the mackerel meet, a single fish, or two if necessary, should be laid to keep the packing level. Cover these with salt, and proceed with the second tier, and so



on till the barrel is filled. There is thus no crossing of tiers, as in the case of herrings. If the fish are fat, a barrel of salt may be required to cure three barrels of mackerel; otherwise that quantity of salt might suffice for four barrels of fish. The reason for the heavy salting is that without it the mackerel would stick together, and, as it would be impossible to separate them without tearing the fish, they would be unsaleable. The barrel should be filled to the croze with fish, and then filled up with strong, clear pickle. Some curers leave their barrels standing on end until the process of cure is complete—*i.e.*, until the mackerel have had time to assimilate the salt and harden and set. It is better, however, as soon as the day's packing is done to put the ends in, tighten the barrels, and lay them on their sides. The time required for the process of curing is from ten to twelve days. During this period the barrels should be frequently examined—a tap on the bilge with an adze or hammer will be enough—to make sure that none of them is leaking. Should the fish be allowed to lie dry they will become soft and discoloured.

In preparing the mackerel for shipment or for market, they have to be emptied out of the barrels, washed in pickle, and selected according to a uniform size and weight into lots of 210 lb. to 215 lb. weight each, which should give the required weight of 200 lb. on arrival at the market. The fish should, of course, have been fairly well selected during the first packing; and, if so, the second selection will give little trouble. In the final packing, however, care must be taken to lay aside soft, ragged, or discoloured fish. The process of packing is the same as before, but a little less salt might be used, provided that the fish are moderately well covered. The top three tiers should be packed with the skin up, and should be a fair and honest sample of the rest of the contents of the barrel. There is no such thing as hard filling of the barrels, as is done in herring curing. The requisite weight of 200 lb. net scarcely fills an ordinary Scotch barrel. The packing finished, the barrels should be at once “tightened,” laid on their sides, and filled with clear, strong pickle.

If these instructions are carefully attended to the results should be very satisfactory. Mackerel so treated should turn out white, strong, well-cured fish.

Before shipment care should be taken that the barrels are full to the bung with pickle, and the hoops well tightened.

Each barrel sent to America should be branded with

the curer's or owner's name, the net weight, and the number of fish contained in it, otherwise it will not be admissible for entry into the United States. Barrels containing from 300 to 350 Irish mackerel are usually most favoured by American buyers. For good, well-cured autumn fish, £2 or more per barrel may be reasonably expected.

Norwegian mackerel have by far the best name in the American markets, and, as a rule, bring much higher prices than British-cured fish. Norwegian mackerel are generally caught by hook and line, and thus taken on board alive. As soon as they are taken on board the boat they are split and put into water. The bleeding is thus perfect, and little or no washing is required, while the fish is whiter and firmer than if the splitting were left until the fish were brought to land. In the selection and sizing, again, the Norwegians are very careful, rigidly laying aside every fish that is in the least ragged or thin. Irish curers have a good deal to learn on these points. With net-caught fish it is impossible to split the fish as soon as they are caught, but strict attention to the sizing, so as to have the desired numbers in the barrels, and the laying aside of all thin or otherwise objectionable fish, would materially raise the standard of cure and bring better prices.

## CHAPTER XIII.

### COD CURING.

**BLEEDING THE FISH.**—Cod which are destined for the fresh market should be killed as soon as caught by a blow on the back of the head. This makes them take on the stiffness of death at once, and preserves their fresh appearance, which would otherwise be spoiled, to some extent, by their death struggles. The fish should then be laid on shelves or in shallow boxes, instead of being thrown in a heap in the hold, as is often done in sailing liners. Cod that are likely to be bought for curing should be treated differently. The first process in the curing of cod should be the proper bleeding of the fish, and this can be best done at sea by the fishermen. When fewer cod were sent to market fresh, and curing was universal, it was a common practice to cut the throats of the fish at sea, in order to bleed them properly. With the extension of the railway system throughout the country, and a better demand for fresh fish, this practice rapidly fell into disuse, as it detracted from the appearance of the fish. But in these days, when cod curers are depending more and more upon trawlers for their supplies, the importance of bleeding the fish at sea cannot be too strongly impressed upon fishermen. The fish are usually put into ice as soon as they are taken from the net, and if, as generally happens, they are caught on the distant fishing grounds, they may have to lie for days, perhaps for weeks, in ice before they reach the market. If so, the blood will be so thoroughly congealed in the bones of the fish that it will be next to impossible to extract it thoroughly. Such fish will never make a first-class article when cured; their "black lugs" and general discolouration will too plainly show their quality, and indicate the condition in which the fish were when they came into the curer's hands. There is, however, no necessity for reverting to the obsolete and ob-

jectionable practice of cutting the throats of the fish. Cod may be very easily and satisfactorily bled when newly caught by cutting one fold of the gill on each side of the head. No doubt it would mean a little extra trouble, but the fish would be so much improved by it that their market value would eventually be increased, to the manifest advantage of the fishermen.

"HEADING" THE FISH.—The next process is the "heading"—or, rather, the *beheading*—of the cod. This should be done with a heavy knife with a long, straight blade, the fish being laid over a small trestle or the edge of a tub during the operation. The operator should lift the fish with his left hand, grasping it about the side of the head, or over the mouth, and laying its neck over the trestle, with the throat up. The gill covers will then open and allow the knife to be inserted easily between the gills and the "lugs" or laps of the fish. Instead of cutting straight down, however, the operator should turn his right hand so as to curve the blade under the head, and take off the scalp of the fish. If correctly done, the result will be as shown in Fig. 1. Thus the bones of the lugs and

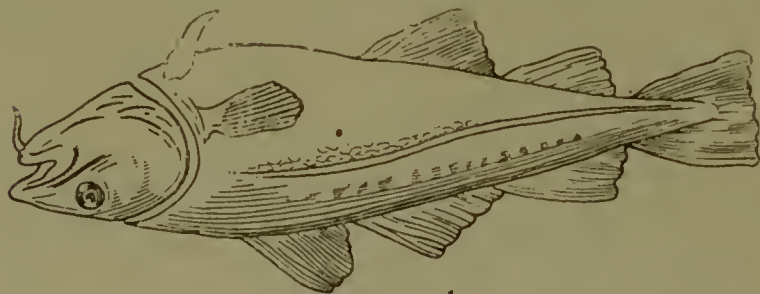


Fig. 1.

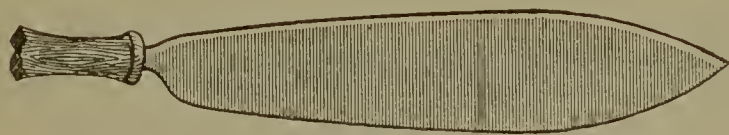
shoulders will be left intact, and the muscles of the neck will be left to strengthen the fish when afterwards split, to say nothing of the slight saving in weight of fish. This, though of no great account in the case of a single cod, would mean something considerable upon a season's cure, and is worthy of a curer's attention. If cut straight across, the bones are apt to protrude and the fish to have a ragged, broken appearance when split.

The "heading" of cod should be done by *pressure* of the knife. If *hacking* is resorted to, the fish will suffer in appearance as well as lose in weight.

OPENING AND GUTTING.—The opening and gutting should be done with a much smaller knife; an ordinary

sheath knife suits very well. The fish should be laid on its side upon a bench or table, its shoulders being towards the worker and its throat towards his right hand. Taking hold of the "lugs" of the fish with his left hand, the operator should insert the knife at the throat and run it down along the belly to the anal fin, the thumb and fingers of the left hand following the blade and steadying the fish during the operation. The opening should be done by one forward sweep of the knife, and not by repeated cuts. Care should be taken, too, not to run the knife deeper down than is actually necessary to open the fish. There is no necessity for liberating the contents of the stomach and scattering them over the bench; nor, in the spring season, for mangling a good marketable roe. After the opening, the liver should first be removed with the left hand and placed in a proper receptacle. Then the viscera should be removed, the long gut being first cut away close to the vent, and then the whole drawn up towards the shoulders with the left hand, and where adhering separated with the knife. A barrel for the offal should, of course, be within easy reach, preferably at the worker's left hand, and partly under the bench. When the roes are in season, care should be taken not to cut or break them. First the gland leading to the vent should be cut as close to the fish as possible, then the roe gently lifted with the left hand, and the filaments at the ends *cut*, not broken away. They should not be cut too close to the roe.

**KNIVES.**—It is scarcely necessary to say that a careful curer will provide good knives and see that they are kept in proper order. If the quality and condition of the knives are what they should be, the work will be better and more expeditiously done than with indifferent and badly kept tools. Fig. 2 shows a sketch of a useful heading knife.



*Fig. 2.*

The blade is 13 in. long by  $2\frac{1}{2}$  in. at the broadest part; the back of the knife is about three-sixteenths of an inch thick near the handle, one-eighth thick at the centre, and gradually thinner towards the point. The handle should be the same shape as in Fig 3, which shows a favourite form of

*Fig. 3.*

a splitting knife. The blade of this knife should not be less than 10 in. long by  $2\frac{1}{4}$  in. to  $2\frac{1}{2}$  in. broad at the shoulder; but some curers prefer 11 in. to 12 in. in length, with breadth in proportion, and thickness as given for Fig. 2. Good cast-steel knives of the above description may be had at moderate prices, but a better blade is a composition of steel and iron welded by hand. It may be described as a ribbon of best German steel welded between two folds of Lowmoor iron. Men who have used this knife almost invariably prefer it to all others.



## CHAPTER XIV.

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### HOW TO PICKLE COD FOR LENT.

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CURERS who lay themselves out for the pickling of cod for Lent, particularly for the Ash Wednesday and Good Friday markets, usually make their preparations pretty early in the winter, so as to be ready to take advantage of any chance of cheap fish that may come in their way. If once properly cured, cod will keep in barrels for weeks, or even months, so long as they are properly kept in pickle. On the other hand, if a curer waits till near Lent before commencing to buy, there is always the risk that prices may be so high as to be prohibitory for curing.

PLANT, ETC.—The requisites for this trade are an ordinary fish-house, with bench and vats, a supply of good fishery salt (second Liverpool generally preferred), and a stock of cod barrels, which are a little smaller than ordinary herring barrels. Offal barrels, carrying baskets, scrubbing brushes, and a set of good knives are, of course, indispensable.

WATER.—The water supply is a most important consideration, as upon its purity the condition and appearance of the fish when finally cured will largely depend. Spring water containing a moderate solution of lime will usually give very satisfactory results, but brown, mossy water is apt to leave a stain on the fish that will detract from their value when offered for sale. So well are some curers aware of this that they will cart water in barrels considerable distances from suitable wells rather than use the public water supply, if the latter does not answer their requirements.

GUTTING, ETC.—The cod should be headed and gutted as already described, and then put into clean water. They may be washed and taken out of this water either immediately or after about an hour's immersion; but they should not be left too long in it.

**SPLITTING.**—The splitting cannot be too carefully and neatly done. So much depends upon the appearance of pickled cod when offered for sale that even greater care is required in handling them than is necessary with fish that are to be dried. Different curers' methods of splitting often vary in certain details; but the following is the method followed by some successful North Country curers: The gutted fish should be laid on the bench with its tail towards the splitter, who should take hold of the upper lug of the fish with his left hand, and with his right hand enter the knife at the vent and draw it down *above* the bone to the root of the tail. He should then give the fish a half-turn—its tail outwards and its shoulders inwards till its back is turned towards him—and, raising the lug with his left hand, split the fish carefully from the bone from the shoulder downwards, leaving as little fish on the bone as possible, and at the same time trying to bring the fish away perfectly clean and smooth. He should next give the now split fish another half-turn, so that its shoulders will be towards and its tail away from him. Then, steadying the fish with his left hand, he should carefully run the knife down under the bone so as to separate it from the fish, and then cut the bone off about twenty or twenty-two joints from the tail. In doing this he should cut through two joints at once, so as to leave the appearance of the figure 8 on the end of the remaining bone. The outer ends of the rib bones, if still adhering to the fish, should be carefully *cut*, not torn away.

To make sure that the remaining bone will be properly bled, it should be pierced with the knife near the tail; or, if preferred, it may be split down for two or three inches from the point of separation.

**CLEANING.**—The black lining of the stomach should next be removed, and any rags of fish or skin which may be visible should be carefully cut away. The fish should then be washed thoroughly, a hand brush being used both inside and outside. The bone should receive special attention, to make sure that the blood is thoroughly removed.

**PRESSING.**—After washing, some curers press the fish for a couple of hours. This may be done very easily by laying the fish on a bench with boards and weights above them, the object being to drain off the water and any remaining blood from the fish. Other curers, again, object to pressure being applied, on the ground that it makes the fish look thin.

**SALTING.**—The fish should then be salted into vats.

Good second fishery Liverpool salt is usually considered best for this purpose; but if a soft cure is desired, Spanish salt is sometimes preferred. In either case the fish should be completely covered with salt, and the salting should be regular, otherwise the fish are apt to have a spotted appearance when cured. The actual quantity of salt necessary will, however, depend to some extent upon the length of time that the fish are likely to be kept before being sent to market, and this can only be learned thoroughly by practical experience. Cod which are to be kept for some time should be salted more heavily than fish that are to be disposed of at once. Three-quarters of a hundredweight of salt may be considered sufficient to cure a barrel of cod.

In salting, the fish should be laid in pairs, face to face, just as kippers are packed. If laid otherwise, there is always a risk that the inside of one fish may be discoloured through contact with the pigment or natural colouring-matter of the skin of the fish next to it. Extra salt should be added to the top tier; and, as the fish make their own pickle, weights should be put on them to keep them down.

DRAWING, WASHING, AND PARING.—After lying in the curing-vat for not less than forty-eight hours, the fish should be drawn out of the pickle. During this process they should be well washed, either in their own or in fresh-made pickle. As each fish is washed it should be laid on the bench in such a position that the pickle will drain from it. After they are washed, the fish should be taken one by one and carefully *pared*. The anal fins should be neatly cut away, and any rags of fish or skin that may have been left about the sides or shoulders should be pared off, so as to leave the fish perfectly clean and well trimmed.

SELECTION.—As the fish are trimmed they should be assorted into two or three different sizes, each selection to be afterwards packed into barrels by themselves. A note of the number in each barrel should be kept, and marked on the barrel.

PACKING INTO BARRELS.—If they are obtainable, birch or other hard-wood barrels are preferable to fir. The latter may impart a flavour of the wood to the fish; the former will not. The packer should lift and handle the fish carefully, so as not to damage them. The best way is to grasp the tail of the fish with the right hand and the shoulder with the left, the skin of the fish being downwards. The fish will thus fall into a partial fold and allow of its being put inside the barrel easily. The bone of the fish should be laid next the side of the barrel. Two medium-sized



fish will make a tier, laid head and tail alternately, as in the drawing above, but overlapping when necessary. A large fish might occupy the whole circumference of the cask. With the exception of the upper tier, which should be laid back up, the fish may now be all packed with the skin downwards, as with the two washings the slime and pigment should be thoroughly removed from the skin.

**SALTING.**—If the fish are destined for immediate consumption, no salt will be required between the tiers, *provided they are already well cured*. This can, of course, only be known by the touch of an experienced curer, who will be able to tell by the firmness of the fish. As a general rule, however, a light sprinkling of salt is advisable.

The barrels should be filled quite full and the ends pressed in and “tighted,” the barrels tiered on their sides and bored on the bilge.

**PICKLING.**—Pickle to put into the barrels should be made a few days beforehand. As described in Chapter IV., pickle is made by dissolving salt in clean water until a potato will float, or until a salimeter immersed in it will register about 25 deg. As for the washing of the fish, so for the making of the pickle—the clearer and purer the water the

better will the cure be. But before being used, the pickle should be strained once or oftener through flannel to make it perfectly clean and free from sediment, after which the barrels should be filled with it to the bung and kept so.

REPACKING.—Should they have to lie on hand for a few weeks, a careful curer will, before sending his fish to market, open the barrels, take out the fish, and, if necessary, wash and trim them again. After repacking, new pickle should be put into the barrels.

THE SMALL DEALER.—Although the foregoing notes are intended as a description of the working of a fair-sized business, a small dealer who might be left with some fresh cod unsold should easily manage to cure them in pickle at very little cost by following the above instructions. A couple of good-sized tubs, a clean, tight barrel, and 1 cwt. of fishery salt would be sufficient stock to start with.

When salting the fish in the tubs it would not be advisable to put one day's fish down upon the top of the previous day's cure. Each day's fish should be salted in a tub or tank by themselves. If the dealer had an outlet for them, his fish would be ready for market after forty-eight hours' cure—or even twenty-four hours if they were going into immediate consumption. If not, they might, after being drawn, washed, and pared, be packed into the same barrel, one day's fish on the top of the other, as they became "due" or ready. A little salt would have to be sprinkled between the tiers, clean pickle sufficient to cover the fish would have to be poured into the barrel, and weights would have to be laid on the top tier to keep all the fish immersed until the barrel was full and the end put into it.



## CHAPTER XV.

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### TO CURE COD FOR DRYING.

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ALTHOUGH it is desirable that fish intended for euring should be bled as soon as caught, and that they should be headed and gutted as soon after being landed as possible, some curers object to splitting what are known as "live" fish (that is, fish landed the day they are caught), especially in winter. After heading and gutting they prefer to leave such fish spread out upon a pavement floor for a night or longer to let them "shoot the *gug*," as it is termed—that is, to throw off the slime from the skin. Newly caught fish are difficult to split; the bone is not easily extracted, and the extra effort required to remove it is apt to mangle the fish when the work is hurriedly done. It is also difficult to remove the slime, which may thus be cured along with the fish, with unpleasant results.

Other curers, again, hold to the opinion that the sooner the fish are put into cure the better, and that any such disadvantages as those enumerated above are more than counterbalanced by having the fish cured in perfect condition. As a matter of fact, however, regarding a good proportion of the fish which go into cure at the principal ports, the complaint often is that they are not fresh enough.

HEADING, ETC.—The process of heading and gutting cod was fully described in Chapter XIII. For dry-curing it is even more necessary than for euring in pickle that care should be taken to *scalp* the fish properly when taking off their heads. As dry fish will have to be oftener handled, both in the process of curing and afterwards, until they finally reach the consumers' hands, there is so much the more risk of their being broken and damaged. If the muscles of the neck and shoulders are left intact, and the lug bones kept well covered, the fish are much stronger and less likely to be damaged in the handling than when the neck is cut straight through. Ling are more difficult



to "head" than cod; but after the throat is cut a jerk with the left hand will usually break the neck over the trestle, and allow the knife to go through without having to resort to hacking, which disfigures the fish.

As in handling large quantities of fish, first on the wharf or in the market, and then carting them to the curing-house, it is scarcely possible to keep them quite clean, a slight rinsing through water is advisable at this stage. This will keep the splitters' bench clean, and will save their knives from being blunted by sand, which might otherwise be lifted with the fish.

**SPLITTING.**—The splitting is best done upon an open bench. Often it is done in the open air, but a fish-house is preferable. The latter affords protection from sun and rain, both of which have a deleterious effect upon fresh fish, and it can be lighted artificially when required. For drying purposes larger quantities of fish have usually to be dealt with by the splitters than for pickling in barrels, hence speed in handling them is imperative. In this case there is no time to trim and pare with the knife; rapid and dexterous work is what is wanted. Here, again, as in preparing pickled cod for Lent, different curers' methods occasionally vary in certain details, but they follow the same general lines. The fish is laid on its side, with its tail towards the splitter, who grasps its upper lug with his left hand, then with his right hand enters the knife at the shoulder and runs it down above the bone to near the tail. The fish should *not* be split through to the skin of the back, as is sometimes done. At least half an inch of fish should be left, otherwise the fish will be frail and easily broken in the handling. To extract the bone, cod should be turned round and the knife run neatly along under the bone; then, with the blade pointing in a slanting direction towards the tail, the bone should be struck below the blood cavity, cutting through two joints at once. Grasping the cut end of the bone, the splitter should again run the knife along under the bone to detach it from the fish. In the case of a ling, the bone might be *pulled* away with the left hand without applying the knife after it is cut through. The part of the bone left in the fish should be pricked near the tail with the knife to let the blood escape. Curers usually object to splitting down the blood bone of a fish that is to be dried, on the ground that it makes the fish too fragile.

**WASHING.**—At the opposite side of the bench from the splitters there should be a trough full of clean, fresh water,

into which the fish should be slid one by one as they are split. This trough should have sloping sides, to facilitate the operation of washing. The blood should be thoroughly scrubbed from the bone, the black lining carefully removed from the inside of the fish, and the slime washed as clean off the skin and fins as possible.

**DIPPING.**—After being washed, the fish should be laid upon gratings, to let the water or any remaining blood drain from them until the curer is ready to salt them. If, for any reason, the curer is unable to salt the fish into vats till the following day, a little dry salt should be powdered over them when they are being laid out upon the gratings.

**SALTING.**—The salting should be done in vats or tanks, larger or smaller according to the extent of the curer's business. A common size is 6 ft. long by 4½ ft. wide by 3 ft. deep; but to accommodate big ling, one or two vats of 8 ft. in length would be found useful. When put into salt the fish should be laid perfectly flat, because whatever shape they take in the vats they are likely to retain afterwards. For this reason, when circular vats are used, the fish have to be laid with their shoulders to the sides of the vat, and their tails pointing inwards towards the centre. They should be pretty heavily salted, and left for four or five days if Liverpool salt is used, or a day longer if it is Spanish salt. Perhaps 45 lb. of salt to cure 1 cwt. of dry fish might be taken as a fair average, but skill in salting can only be attained by experience. The salting may, however, be fairly accurately tested when the fish are drawn from the vats. A little salt should then be found remaining, all through the vat, between the layers of fish. If, however, say, half a barrel of salt were left in a 6-ft. vat after the fish had been drawn from it, the inference would be that more salt had been used than was necessary to cure the fish. The fish should be filled, or rather heaped, above the level of the top of the vat, and it is advisable to turn the fish of the top tier back up. In a couple of days they will be floating in their own pickle, when stones should be placed upon them to keep them immersed. If the vats are standing in the open air, they should be fitted with roof-shaped covers to shelter them from the sun and rain, fresh water being specially objectionable.

**DRAWING FROM THE VATS.**—After the fish have been in the vats from four to six days they may be drawn out. All fish vats should have bungholes in them; but it is not wise to run off all the pickle *before* drawing the fish. By

the dissolution of the salt, a certain amount of chalky sediment is usually deposited upon the fish, and this should be washed off in the pickle as the fish are drawn from it. It seldom happens that a curer is ready to commence drying his fish immediately after they are taken from the pickle, so the fish are usually built into *steeples*, with a sprinkling of dry salt between the tiers. In these piles they might be kept for two or three months if necessary; but if so they should be turned over again and sprinkled with more salt.

**DRY SALTING.**—When fish are cured aboard vessels—for instance, at the deep-sea fishing off Leeland—pickle vats are not available, and the fish have to be dry salted. For this purpose “lockers” are fitted up in the sides of the vessels, and into these the fish are laid and salted in the same way as into vats. More salt must be used in this case, however, and care has to be taken to spread it freely round the sides of the lockers, as well as over the fish, otherwise the exposed parts of the fish may be imperfectly cured. After lying for about a fortnight the fish should be turned over and re-salted.

In shore curing, also, dry salting has sometimes to be resorted to in an emergency; for instance, in the event of a heavy fishing, when a curer's vats may be all full. The difficulty in this case is to get the exposed parts of the fish salted so as to be thoroughly cured, and advantage should be taken of the angle of a wall or any temporary partition that can be fixed up, to help to keep in the salt, which should be applied unsparingly.

The sketch on the next page shows the ground plan of a cod-curing house 50 ft. long by 25 ft. wide, with walls 8 ft. high. A building of this size has accommodation for curing a considerable quantity of fish; for a small business a much smaller place would suffice. The floor should be of concrete or pavement strong enough to bear the weight of a loaded cart, and a slight slope from the back towards the front would help to keep the place dry. It should be well drained and have a plentiful supply of water, with a rubber hose long enough to reach all round the building. If there were no loft above, the place would be best lighted by skylight windows. If there were a loft the fish-house below would have to be well supplied with windows on both sides. Gas, for night work, should be led along the centre of the rafters.

A large doorway through which the fresh fish would be brought in is shown at (1), and at (2) the fish would be laid out ready for the commencement of operations. At (X)

# GROUND PLAN OF A COD-CURING HOUSE.

50 ft. long by 25 ft. wide, with walls 8 ft. high.

11.  
CURED FISH drawn from vats  
and laid in dry salt in steeples.

12. DOORWAY.

11.  
CURED FISH drawn from v  
and laid in dry salt in steeples.

10.

10.

10.

10.

10.

10.

9.

GRATINGS, FOR DRIPPING  
FISH.

9.

9.

8.

WASHING TROUGH.

7.

SPLITTERS' BENCH.

6.

TROUGH of WATER  
to rinse fish through.

5.

GUTTED FISH.

4.

BENCH for OPENING and  
GUTTING FISH ON.

3.

HEADED FISH.

X

TRESTLES or TUBS,  
for heading fish.

X

2.

FISH, AS LANDED.

1. GATEWAY.

FRONT.

FRONT.

there would be trestles or tubs upon which to "head" the fish, which would then be laid out at (3). A labourer would lift them from (3) to the bench at (4), where they would be gutted and then laid out at (5). From (5) they would be passed through a trough of water (6), and thence to the splitters' bench (7), over the back of which they would be slid, when split, into the washing trough (8). After being washed they would be laid out upon the gratings (9) till ready to be salted into the vats (10). After being the necessary time in pickle, the fish, if not to be immediately dried, would be laid in "steeples" with a sprinkling of salt about them at (11). No. (9) might either be simple gratings laid on the floor, or large, shallow troughs raised upon legs to about the height of a bench. If more vats were required, they would be set either alongside (10) or extended in line—→towards the front of the building. Through the doorway (12) salt would be brought in and salt fish passed out.

**WASHING OUT OF THE SALT.**—Before being laid out to dry salted cod have to be very carefully washed. The blood bone should receive special attention; all black skin should be removed from the inside of the fish, and any slimy matter adhering to the skin should be thoroughly brushed off.

**DRYING.**—Beach drying is the oldest method, and it is still extensively practised in summer where suitable beaches are available. For fish drying a beach should be composed of good-sized stones, which should be perfectly clean; and it should be open enough to benefit by every wind that blows. A beach of fine gravel is quite unsuitable for fish drying. Artificial beaches are frequently to be met with at some of the northern euring stations. These are rough causeways of good-sized stones laid down to imitate beaches where none formerly existed suitable for fish drying.

**SCALDING.**—In beach drying the first danger to be guarded against is the scalding or blistering of the fish by the sun. This risk is greatest during the first few days of exposure. Curers should, therefore, avoid laying their fish out when the stones are very hot, or when the weather conditions are such that the beach is likely to become very hot during the day. A day when there is a fresh sea breeze and when the sun is not too strong is best.

The fish should be laid out first on their backs, but as the process of drying goes on frequent turning is advisable. For the first day or two it is sufficient when night approaches



to gather the fish, back up, into small bundles or clamps. As the fish get harder, these heaps should be increased in size, and protected from the damp by tarpaulins or other suitable covers.

**SWEATING.**—After about a fortnight's drying the fish should be gathered together and built into large steeples, which should be carefully covered. Upon these stacks planks with stones or other weights should be laid, to press the fish flat and give them a smooth, compact, and uniform appearance. Unless the fish are thus pressed during the process of drying they are apt to shrivel up at the edges and suffer in appearance. In these steeples the fish should be left for ten days or a fortnight, but if the beach were occupied with another supply of wet fish they might be left longer. This process is known as the sweating or pinning of the fish, and it should be carefully attended to, otherwise the cure will not be complete, and the fish will very likely turn damp and spoil when stored.

When sufficiently sweated the fish should again be turned out and dried for about a week, after which a second sweating for a few days would be advisable. A couple of days' drying after this should complete the cure. The whole time occupied in drying the fish would thus be about six weeks under favourable conditions; if otherwise, it might be much longer.

**STORING.**—When gathering the fish from the beach for the last time the curer should make sure that they are collected in a cool state. If taken warm from the beach there is a risk of deterioration in the store, which should be a clean and substantial building. While in the store the fish should be carefully covered up to exclude air and dust.

**FLAKE DRYING.**—Flake drying has much to recommend it. Beaches are not always available, but any piece of waste ground may be utilised for the erection of flakes. On the whole, however, a piece of a grass field may be considered best, as there is least risk of dust blowing there. If the risk of blowing dust is guarded against, flake drying may be depended upon as an absolutely clean process. Then the risk of scalding or blistering the fish under a hot sun is reduced to a minimum; and owing to the fact that the air can act on the fish from beneath as well as from above, fish can be sooner dried on flakes than upon a beach.

**WOODEN FLAKES** are constructed as follow: Four runners, each 12 feet long by  $1\frac{1}{2}$  inches square, are fastened at equal distances apart to four bars, each 2 feet long by 3 inches broad by  $\frac{5}{8}$  inch thick. This gives a flake 12 feet



long by 2 feet wide. If preferred, the flake might be 3 feet wide, in which case there would be five 12-foot runners nailed upon four 3-foot bars. The bars might be a little stronger—say, 4 inches broad by  $\frac{3}{4}$  inch thick. For standards or supports for the flakes stout posts are driven into the ground, and stout beams 6 feet long are fixed across them. Three of the narrower or two of the broader flakes can be stretched across a couple of these supports.

**WIRE FLAKES** are also used. These are sheets of very strong galvanised wire netting, 6 feet wide, with five stout wires running through them, the edging also being of strong wire. These wire flakes have this advantage, that they occupy little space when stored away at the close of the drying season.

**FIXED WIRES.**—Sometimes a fixed wire framing is erected. Standards 5 feet or 6 feet wide are set up at intervals of 12 feet, and across them strong galvanised wires are stretched, about 9 inches apart. These fixed wires may be of any length that the ground will allow, and, like the portable wooden and wire flakes, they should be raised about  $2\frac{1}{2}$  feet above the ground.

Between the rows of flakes or wires passages have to be left of sufficient width to permit of the necessary traffic involved in laying out and gathering in the fish.

**SMALL LOTS.**—The retail dealer who might wish to cure a few fish should not, with ordinary care, find it a very difficult matter. A small vat, a supply of fishery salt, a knife, and a hand brush would be all the plant required. In connection with the drying of the fish there might be some difficulty. His back yard might be so built round as to exclude the wind, which is so essential a factor in the drying of fish. Or, on the other hand, there might be a risk of dust blowing or soot falling so as to spoil his chances of making a successful cure. But, given a clean, airy yard, no matter how small, it should be possible to produce perfectly cured fish by flake drying. The flakes would, of course, have to be made to suit the available space, and empty barrels would make convenient supports for them. It may be worth noticing that, in spreading out fish to dry, space can generally be saved by laying them head and tail alternately.

For the benefit of anyone who does not know the relative weights of wet and dry fish, it may be mentioned that about 3 ewt. of live fish will be required to produce 1 cwt. of dry salt cod. Of gutted fish it would take about  $2\frac{1}{4}$  cwt., and of wet salted fish about  $1\frac{1}{2}$  ewt.

### **To Cure and Dry Flake (Dog-Fish).**

Some time ago information was asked as to the curing of dog-fish or flake, as it is now called in the markets. Half a century ago or less, fisherwomen on the east coast of Scotland used to cure dog-fish for home consumption, and the method of cure was as follows:—The fish were first headed and then split down the back, commencing at the shoulders of the fish, and keeping the knife running along the upper side of the back-bone, half of which might afterwards be removed in the case of a large fish, as in cod splitting. The offal was removed, and the fish were well washed in clean sea-water, after which they were spread out to dry upon the rocks or beaches, as near the sea as possible. Frequent turning was necessary, especially the first day. As no salt was used in the curing, special weather conditions had to be chosen before starting. What was wanted was dry, breezy weather, preferably with sea winds. The fish had to be taken indoors before there was any risk of dew falling on them in the evening. If showers fell on them, or if a spell of moist, warm weather set in before the fish were thoroughly dry, they were apt to become oily and dark coloured, in which case they were usually thrown away. With a few days of suitable weather, however, a very nice, palatable article was produced. The fish were generally roasted on a brander over a clear fire, some people preferring to give them, in addition, a hasty scalding in boiling water. It is scarcely necessary to say that fish cured in this way could not be regarded as a safe article to store for any length of time, or to send abroad. From twenty-four to forty-eight hours in salt or pickle, according to the time they were likely to be kept in store or the climate of the country to which they were likely to be exported, would be required before drying, if the fish were to be kept long. Large quantities of dog-fish are dry-salted on board Swedish line-fishing vessels, these fish being regarded as a perquisite of the crews. Hard curing, it is generally admitted, detracts from the flavour of dog-fish and rays.

## CHAPTER XVI.

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### TO DRY SALT FISH BY FIRES.

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ALTHOUGH, as already described, salt fish can, under favourable weather conditions, be satisfactorily dried either on beaches or upon flakes, a curer who depends entirely upon either system is seriously handicapped, since he can dry his fish only during the spring and summer months, to say nothing of the delay and loss he may suffer in a wet season.

Before what is known as "kiln" drying became universal, all the cod and ling cured in autumn and winter, including the proceeds of the autumn voyages of the vessels engaged in the Faroe and Iceland fishings, had simply to be stored away in dry salt till the approach of summer allowed them to be exposed outside. The tying up of capital for such a length of time would be a hardship to the average curer nowadays, when all purchases have generally to be settled for weekly. The fact is, no one who is doing, or who intends to do, a fair-sized business in fish-drying, can consider his preparations complete unless he is provided with suitable premises for the drying of his fish by means of coke fires.

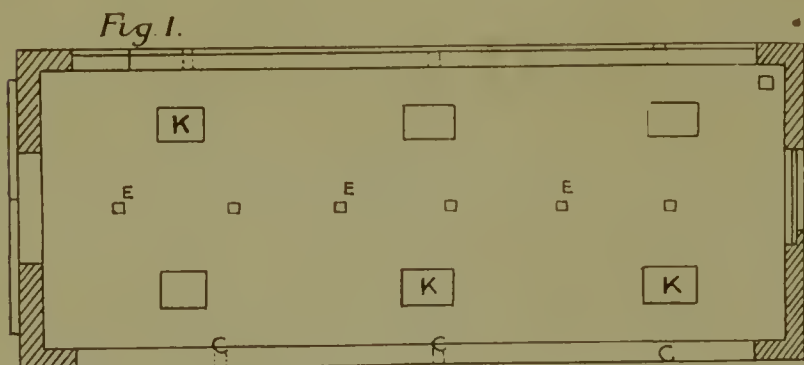
It is not absolutely necessary that a specially designed building should be erected for this purpose. Almost any ordinary store, with a brick or pavement floor as a safeguard against fire, can be converted into a drying shed with comparatively little trouble and expense, always provided that the framework of the building is strong enough to bear the strain caused by the weight of the fish. Such improvised drying sheds may be seen at any of the large fishing and curing centres; and the fittings are sometimes of the simplest possible description. In buildings too low in the ceiling to admit of more than one tier of fish being hung, rows of tenterhooks have been driven into the joists, or long bars of wood with tenterhooks on each side have been fixed across the joists at intervals of about 15 inches apart, and

fair quantities of fish satisfactorily dried on them—fish that would otherwise have lain on the curer's hands for half a year in salt.

For the benefit of anyone who may wish for a few hints as to the construction of a new building for the artificial drying of fish, the following suggestions are offered, and the accompanying plans submitted:—

Fig. 1 shows the ground plan of a drying shed 60 feet long by 20 feet wide; fig. 2 gives a lateral view; and figs. 3 and 4 show the gable and the framework. The roof is slated, and the side walls are 8 feet high. The floor and 4 feet of the walls, both sides and gables, are of concrete. The floor slopes gently to one side, where there is a small open channel or gutter, which is trapped and drained.

Up the centre of the building there are six strong wooden pillars (fig. 1, E), which help to support the heavy



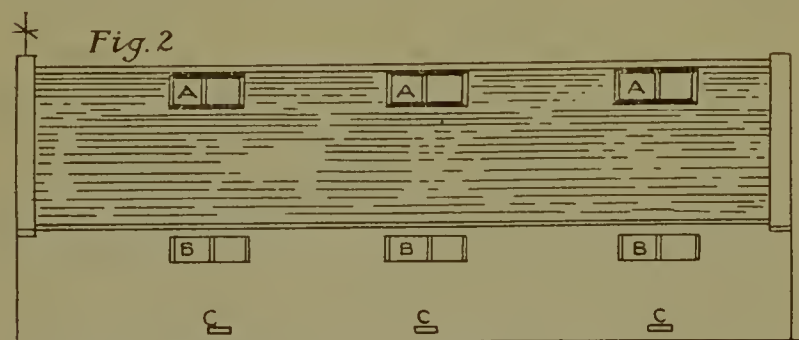
joists which run across the house from side to side (fig. 3, F). Over these joists and about a foot above the top of the side walls four strong beams run from end to end of the building (fig. 3, D). Stout couples and diagonal stays help to strengthen this framework and fit it to bear the heavy weight of the fish when hung upon the tenters.

Upon the four long beams (fig. 3, D) pulleys are fitted about a foot apart, and upon these pulleys the tenter frames are suspended. There are four perpendicular rows of tenters upon these frames, the rows being about 15 inches apart. The tenters (*i.e.*, tenter sticks) are  $1\frac{1}{2}$  in. by  $1\frac{1}{2}$  in., flat at the back but rounded at the front, where the hooks are fixed. The latter are set about 5 inches apart. Each tenter frame is double—that is, it has four rows of tenters facing each gable of the building.

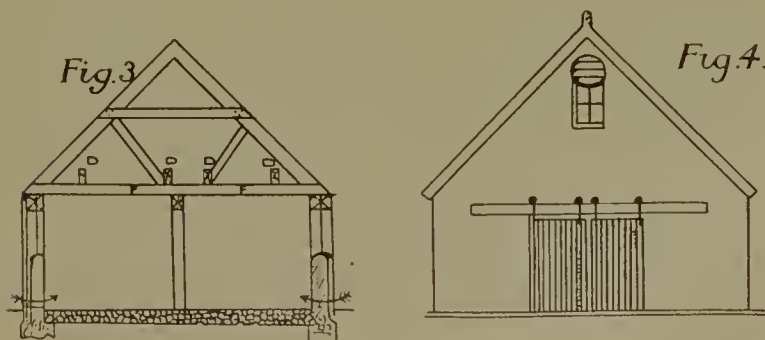
Along the sides of the building, about 5 feet or 6 feet from the ground, there are beams with cleats or other

arrangements for fastening the ropes connected with the pulleys. Similar beams and cleats run along both sides of the central pillars at a corresponding height from the floor. Some up-to-date drying sheds have small winches for hoisting and lowering the tenters. Since this house is divided longitudinally by its central pillars, and the fittings occupy a good deal of space, the length of the tenter frames would be considerably less than half the width of the building, and the fittings and arrangements on both sides would be identical.

The rest of the plan requires little explanation. In the roof there are three pairs of hinged skylights, fitted to open with pulleys and cords (fig. 2, A); and in the walls



below there are three pairs of side lights, dead glazed with rough plate (fig. 2, B). Cast-iron "hit-and-miss" ventilators (fig. 2, C)—three on each side—regulate the draught as required. Fig. 1, K, shows the approximate positions of the chaffer furnaces, in which are the coke fires for drying the fish. These furnaces are simply *wheelbarrow grates*, with radiating iron plates covering the fires. They are usually set about 12 feet or 15 feet apart, and they are





frequently shifted to give all the fish an equal share of the heat. For a building of this size six fires would be required.

The cost of a building of this description, with fittings, would probably be about £260—more or less, according to the locality and the cost of material.

Why a higher building is not recommended is that the four rows of tenters described above can all be reached from the ground when the frame is lowered. If the building were high enough to admit of, say, eight rows of tenters on the frame, ladders or some other arrangement would have to be used before fish could be hung on the upper tenters. In the building described, when all the tenters are filled and hoisted up, the lowest fish should be about 5 feet from the floor.

Fish intended to be dried by fire are, of course, cured in exactly the same way as fish which are dried outside. When drawn from the pickle vats they should be laid out to drain for a short time, preferably on a grating, and then hung up on the tenters. If for any reason they cannot be hung up for some time, they should be built in steeples, with a powdering of dry salt over each tier of fish, and well covered with matting or tarpaulin.

**TENTERING.**—When the curer is not pressed for space it is a common thing to hang all the fish up by their tails, the tenter-hooks being inserted through the centre of the fish near the root of the tail. If, on the other hand, space has to be economised, they should be hung head and tail alternately. By this means a considerable saving of room is effected, without the necessity of any additional heating.

**FUEL AND HEATING.**—The fuel used is gas coke, which gives heat with a minimum of smoke. Both smoke and dust have to be carefully guarded against lest the fish be soiled and discoloured. The furnaces have, therefore, to be filled and lighted outside, and the fires burnt red before being taken in and set under the fish. As already explained, the furnaces should be set 12 ft. or 15 ft. apart, but they should be frequently moved about so that all the fish may get an equal share of the heat, and none of them be overheated. As in beach drying, the greatest risk of scalding the fish is during the early stages of exposure. The fish are, of course, hung up wet, with the pickle dripping from them, and although they are not so tender as kippers or finnon haddocks, yet too high a temperature would cause such a steam as would blister the fish, and some of them would probably fall off the hooks. When



the fires are first applied the ventilators should all be opened, and the temperature of the drying shed regulated to about 60 deg. Should it mount up to 70 it would be advisable to wheel some of the furnaces outside for a time. After the first day a temperature of 70 deg. would not be too high, and during the final stages of drying 75 or even 80 deg. might be risked when the fish get hard.

One advantage of "kilm" drying is that it can go on continuously, day and night, a man being left in charge at night to attend to the fires. Constant application of the fires is not necessary, however; the fires may be allowed to go out at night and be rekindled when desired; but it is generally considered advisable to keep them burning constantly.

After about 48 hours' constant drying the fish should be ready to be taken down and built up in steeples to pine or sweat. They should be left thus for at least a fortnight, but if it is not convenient to hang them again at the end of a fortnight, they might be left longer. For medium-sized fish, other 48 hours' exposure to the fires should complete the drying. Before making the fish up for the market, however, it would be as well to build them in steeples again, with planks and stones or other weights over them for a day or two. After this second pining extra large fish would probably require at least other 24 hours' drying to make them hard enough for exportation.

As to the comparative merits of outside and inside drying, opinions differ. Some curers who have tried all the methods of drying think that exposure to the open air produces really the best and most wholesome fish. It is just possible, however, that they may overlook the fact that when the drying was all done outside they generally got fresher fish to handle than those available for curing nowadays. Then the state of the weather brings such an element of uncertainty into the business that not only may much time be lost through unsuitable atmospheric conditions, but it might be absolutely impossible for a curer to get his fish dried to his mind outside. With a drying shed, on the other hand, he is independent of the weather, and can calculate to a day when his fish should be ready for the market.

In the opinion of some experienced curers, the ideal cure can be best obtained by drying and sweating the fish outside until 24 hours "kilm" drying will make them as firm as desired. The sulphury taint of the coke fires, which is considered by many people to be objectionable, is

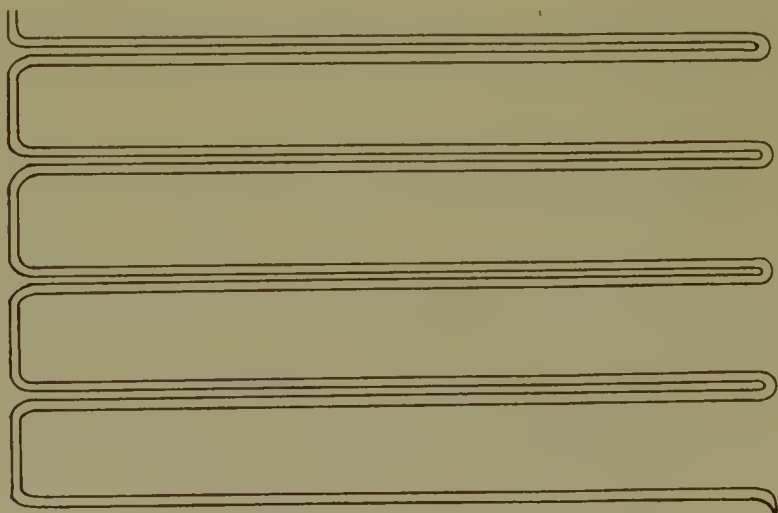
scarcely discernible after only 24 hours' in the drying shed, but it is claimed that even in this short time the fumes of the sulphur usually deter mites from attacking the fish afterwards. The subject of fish mites will be referred to later.

### **Cod Drying by Steam.**

Cod drying by steam pipes is not unknown in the curing trade, but some of the firms that formerly used pipes have discarded them in favour of the chaffer furnaces. The reason why steam might be preferred in lofts with wooden floors is probably that there is less risk of fire from steam pipes than from open fires.

One northern firm had steam pipes led through a drying shed many years ago, and found them useful enough for drying up autumn-cured fish; but when chaffer furnaces came into use they took out the pipes and introduced the furnaces, as being simpler and more satisfactory.

The pipes were led along the floor, as shown in the accompanying sketch.



They were generally wide pipes, perhaps 6 in. in diameter, and they were laid about 2 ft. apart, sometimes singly and sometimes in pairs.

The chaffer furnaces appear to have given most general satisfaction.

## CHAPTER XVII.

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### PREPARING AND PACKING DRY FISH FOR THE MARKET.

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In the making up of dry fish for the market, just as in the curing of the fish, a tidy curer may find room for the display of his taste. At this particular stage the more attractive he can make his goods the better will be his prospects of finding buyers.

SPAIN.—For the Spanish market, which takes a large quantity of British-cured fish, cod are weighed out in lots of 50 kilos, or about  $1\frac{3}{4}$  lb. short of a cwt. These lots are then packed up and sewn into pack-sheet covers. Exporters generally find it convenient to use a sort of box shape in which to make up these so-called cwt. lots. This box has neither lid nor bottom. It is about 32 in. long by 18 in. broad and 11 in. deep, and has a handle at each end. The packing is done as follows:—A pack-sheet cover, 48 in. by 40 in., is spread upon the packing table, and on the centre of this the box is placed. As each lot is weighed out, the fish are carefully packed inside the box, with their shoulders to its ends, after which the box frame is raised and lifted off by means of the two handles at its ends. Over the neat little pile of fish left, the pack-sheet cover is then folded, and three stout lacings of cord are strapped round the package—one round the centre and one near each end. The sheeting at the ends of the package, which has hitherto been left loose, is now folded in and sewn up in such a way as to leave a “lug” or handle at each of the four corners, by which to lift the package. This style of packing is said to suit the requirements of the Spanish trade admirably. The packages can be handled easily, and the covers protect the fish from dust and damp. In a country where a good deal of the traffic is still carried slung across the backs of mules, these are important considerations.

TRADE MARKING.—In the Spanish markets the principal demand is for codfish, and these are often trade-marked by the exporters. This trade-marking is an interesting

survival of the Government brand, which, early last century, used to be applied to cured cod and ling, under the auspices of the Board of British Fisheries. At that time a Government bounty was paid to curers for the encouragement of the British fisheries. Unlike the present-day system of branding cured herrings in Scotland, where only a small percentage of the barrels is opened and examined, *each cod or ling* was then passed through the hands of the inspecting officer. If found worthy of the brand the fish was laid upon a block and struck near the tail with a small punching hammer, which cut the shape of a miniature crown out of the fish. Modern trade marks are punched in the same way.

COLONIAL TRADE.—A limited trade in dry salt fish is done with some of the British colonies—for instance, with Cape Colony, Australia, New Zealand, and the West Indies, although the West Indies and the South American States perhaps draw most of their supplies from Newfoundland or the United States. The duty on fish imported into some of the colonies almost equals its selling price in this country. Instead, therefore, of being a cheap article of food, dry fish in these markets must be reckoned quite a luxury. As a rule, the very best ling and cod are sent to the British colonies. The fish are made up in cwts., but, instead of pack-sheet or canvas covers, strong boxes, lined with tin and hermetically sealed, are generally used. For the packing of ling the box is usually 3 ft. long by 13 in. broad and 11 in. deep. It weighs, when lined, from 26 lb. to 28 lb. The fish are packed head and tail alternately in this box, as in the box frame used for the Spanish trade.

HOME MARKETS.—Little need be said about the home markets. Although, with the improved facilities for obtaining a regular supply of fresh fish, the demand for hard-cured goods may be expected to decrease, there is still a considerable outlet for dry fish, both in Great Britain and in Ireland. So far as one can judge, cwt. parcels covered with pack-sheet appear to be growing in favour, no doubt for the same reasons that have led to their popularity in the Iberian peninsula.

## CHAPTER XVIII.

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### COD CURING.—FISH PARASITES.

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FISH MITES.—As has been already hinted, one of the greatest dangers that a curer has to guard against in the drying of salt cod, etc., is the risk of parasites attacking the fish. The most common parasite is the ordinary fish mite, which is apt to appear upon fish showing any signs of damp. Fish that are "mited" look as if they had been powdered over with coarse black pepper. Mites may attack the fish either on the beach during the process of drying or in the store, after the cure is complete. A common cause of the commencement of mites is when a sudden fog comes down upon fish that are laid out to dry and the curer cannot get them gathered and covered until they have contracted damp. The drier the fish are at the time the greater will be the risk. Wet fish are not so liable to suffer. During the final stages of the drying, therefore, the curer should be specially careful not to lay out his fish if the weather is not favourable, and should fog or rain threaten he should gather and cover up the driest fish first. If, in spite of his precautions, the fish get damp, he should hang them up in a drying shed and apply fires for 24 hours. This is generally believed to be sufficient to save the fish from the ravages of parasites; but when these appear some curers take the additional precaution of washing and scrubbing the fish in strong pickle before giving them the final 24 hours' drying.

To guard against mites in the store the curer should see that his store is thoroughly clean, dry, and airy. He should avoid taking in his fish when they are warm; therefore, in hot weather he might find it advisable to remove them from the beach or the flakes, either in the morning before they have become heated or late in the afternoon when the heat of the day is past. On no account should he store fish in damp weather. While kept inside the store they should be carefully covered up. Some curers do not consider it safe to uncover and handle dry fish even inside a store if the weather outside is foggy or wet, lest the damp state of the atmosphere should damage the fish.



**RED FUNGUS.**—Among other parasites that sometimes appear upon cured cod is one that gives a red colour to the fish, and which, though more uncommon than the ordinary fish mite, is, perhaps, more dangerous, and certainly more difficult to get rid of. A good many years ago the so-called "Red Cod" were brought under the notice of the Fishery Board for Scotland, and at their request Professor Cossar Ewart, of Edinburgh University, examined the fish, and, with the assistance of Dr. Edington, made an investigation as to the cause of the discolouration. They found that the red colour was caused by a minute fungus, which they termed *Bacillus rubescens*. They found germs of this fungus in some of the salt used for curing the fish, especially in Spanish salt; and they also came to the conclusion that these germs might grow in the woodwork of the curing houses or on board the fishing vessels. They were of opinion that *Bacillus rubescens* did not thrive below 65 deg. Fahr., but developed rapidly in hot and moist weather. For this reason, no doubt, in fish which appear sound enough during the process of cure these germs may develop and spread rapidly when brought into more favourable atmospheric conditions.

**PRECAUTIONS.**—To prevent the growth of the fungus these scientists recommended that the water used in fishcuring should be as pure as possible; that only clean salt should be used; that after salting, the fish should be dried as quickly as possible; that boracic acid should be used in the curing, in the proportion of 3 per cent. of the water used, and that the curing sheds, vessels, and implements, when suspected of being infected, should be thoroughly washed with a solution containing one part of corrosive sublimate to a thousand parts of water.

With regard to the use of boracic acid there may be differences of opinion, but there can hardly be two opinions as to the necessity for scrupulous cleanliness in everything connected with the curing of fish. The value of a good supply of pure water has been repeatedly emphasised here. At the close of each day's work the fish-house and all its utensils should be thoroughly washed; and at least once a year disinfectants should be used in the washing, whether the presence of parasite germs be suspected or not. Every utensil and implement should then be disinfected, from the knives and brushes to the vats and flakes. The third of the above recommendations—that the fish should be dried as quickly as possible after salting—is generally complied with nowadays by the use of drying sheds.



## CHAPTER XIX.

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### ROES, LIVERS, AND OFFAL.

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THESE by-products are by no means a negligible quantity in fishcuring. In the curing of cod and ling especially they may be made to contribute very materially towards the working expenses.

ROES.—The popularity, and consequent value of good fish roes are too well known to need much comment. Roes may be sold, and generally sold well, in almost any market where fresh fish are offered for sale; so the curer who finds himself in possession of cod or ling roes should have no difficulty in disposing of them to his advantage. During the spring months, when the roes are in season, all fish should be opened very carefully in order to avoid damaging the roes. (See Chapter XIII.)

As the roes are tender, they should be handled gently and kept quite clean. Small kits or kegs would no doubt carry roes most safely, but as it is not always convenient to get these, kipper boxes may be recommended as a very good substitute. Clean paper should be laid below and above the roes to exclude dust and air; and as roes are heavier than kippers, the boxes should be more securely nailed when the former are being carried. A piece of cord might, if desired, be tied round the middle of the box.

If the roes have only to go an ordinary railway journey, and are intended for sale on the following day, they need no special treatment except to be kept whole and clean. If they have to go a long journey and be subjected to frequent handling, they should either be sprinkled with ice or salt when packed or be washed through pickle before packing.

#### To Cure Cod and Ling Roes.

A large and apparently growing trade is done at the principal fishing ports in the curing of roes, which are afterwards exported to France, to be used as bait for the sardine fishery. The method of curing is simple enough. The roes are usually washed in clean water—sea water

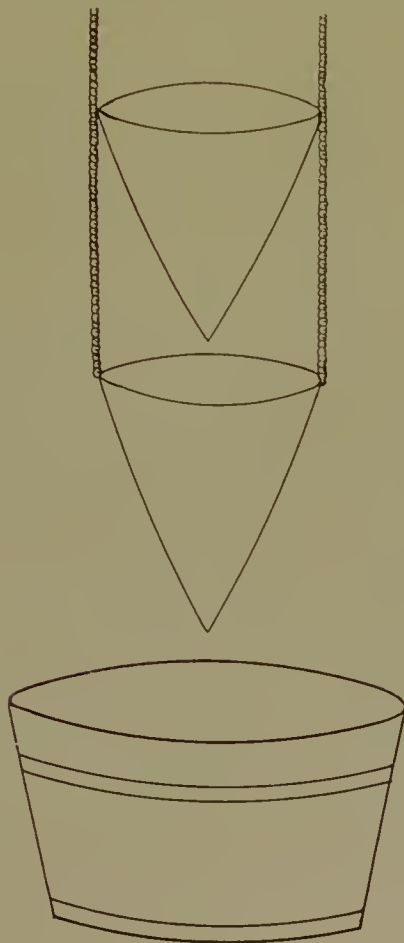
would be best if it could be got clean—and then salted into tight barrels. They are cured in much the same way as herrings, a layer of salt and a layer of roes alternately until the barrel is full, the *legs* of the roes being spread out in packing to allow the salt to penetrate them thoroughly. When full, the barrels are headed-up, laid on their sides, and kept for 10 or 12 days. The roes make their own pickle, but the curer should, of course, see that his barrels are tight and full of pickle. A small quantity of roes might be salted down on the top of a vat of salted cod or ling; but curing in barrels is the more satisfactory method. When drawn from the pickle, the roes are dry-salted on a floor, where they are allowed to lie for a while to let the pickle drain from them. Some curers prefer to turn them over and give them a sprinkling of fresh salt during this drying process. When quite dry and hard, they are packed into light dry-ware casks, in which they are sent to market. These casks somewhat resemble carrier barrels, but they are fitted with two ends and have an iron hoop on each end. Roes are occasionally sent to market in the seastick state—that is, in the original pickle; but dry-curing is the rule.

If a flavour of smoke were wanted, the roes would have to be smoked in the same way as fish fillets—*i.e.*, laid across pairs of iron spits, or tenter-sticks without hooks, and smoked in a kiln for a short time. The smoking of roes is, however, a practice more honoured in the breach than in the observance, since in the ordinary process of drying the roes assume a dark, smoky appearance through exposure to the air.

**LIVERS.**—If a curer can dispose of his fish livers to an oil factory, it will, as a rule, be best for him to do so. He will thus get them off his hands promptly, and will be rid of the trouble of manufacturing the oil. The owners of the factory, by making a special study of their business and having a large turnover, would probably be able to give as much for livers as the small curer could make out of them, and still have a working profit for themselves. Then, too, as the smell of boiling oil is a little offensive, there might be objections on the part of the local sanitary authorities to its manufacture on the curer's premises. But if there is no other way of disposing of his livers profitably, and there are no objections to his boiling them on his own premises, the curer ought certainly to make arrangements for manufacturing oil.

There are two kinds of fish oil—medicinal cod liver oil and brown or tannery oil.

**MEDICINAL OIL.**—For the first, only perfectly fresh cod livers should be used, and these should be manufactured as soon as received. The making of cod liver oil, though rather a tedious process, is not so difficult as many people suppose. Anyone who may wish to extract the oil from one or two good livers may do it in this way: Place the livers in an old milk can and put on the lid. Put the can in a pot of water, and boil the water steadily. The oil will be drawn from the livers and will rise to the surface, whence it may be skimmed or poured off from time to time. From an hour and a half to two hours' boiling should suffice to draw off the oil, which will, however, still contain a good deal of sediment. To purify it, the oil should be run through double flannel filters. It is generally considered advisable to chill, or, at least, cool, the oil before filtering.



and if no better arrangement can be made, the cooling may be done by immersing a vessel containing the oil in a larger utensil containing cold water. A simple and useful filter is a cone-shaped flannel bag, with a stout wire ring at the top to keep it open. Two of these bags should be used, one hung above the other, as shown on the preceding page. The oil should be poured into the upper filter and allowed to run through it to the lower. A clean tub or other vessel should be placed below to receive the filtered oil. The "foots" or sediment left in the filters should not be thrown away: a good deal of brown oil may be extracted from it.

Larger quantities of livers may be treated on the same principle in large double-jacketed pans, the jackets or spaces between the pans being filled with water. Sometimes steam gear is fitted to the pans, with arrangements for stirring the livers during the boiling, and thus hastening the process.

Steam is also used to cook the livers, and thus dispense with the fire necessary for each pan. In this case the steam is introduced by a pipe into the centre of a tank or vat containing livers, through which it circulates and causes the oil to rise. This is said to be one of the cheapest and most effective methods of making medicinal oil.

For refining large quantities of oil, specially constructed filter presses are used.

**BROWN OIL.**—The manufacture of brown oil is a simple process. Indeed, were it not for the offensive smell caused by the putrefaction of the livers, all that would be required to get this class of oil would be to leave the livers in a tub or tank, and the oil would gradually come to the surface, when it might be skimmed off and put into casks. Such a method, however, even if permissible, could hardly be called satisfactory. To extract all the oil the livers should be boiled, or, rather, roasted, over a fire in a single boiler. The refuse from this and the other processes should be pressed, so that no oil may be lost.

**OFFAL.**—The value or otherwise of the fish offal—that is, the heads and intestines—will depend entirely upon the locality where the curer may be working. At a few out-stations fish offal is worthless, or the curer may even have to be at the expense of removing it. As a rule, however, there should be an outlet for the offal, either by selling it to a guano manufacturer or to some enterprising farmer who knows how beneficial fish manure will be to his land. Cases are known where farmers year after year pay a good price for manure of this description, and are then at con-

siderable expense for carting and railway freight before getting it to its destination. This points to the possibility of *creating* a market for the offal to the mutual benefit of buyer and seller.

As its prompt removal will be an aid to cleanliness, preference should be given to the buyers who can be depended upon to take away the offal regularly.

## CHAPTER XX.

### HADDOCK CURING.

In attempting to describe the curing and smoking of haddocks, it may be as well to take first the old style, by which all the work is done by hand only, without the aid of machinery. It is scarcely necessary to say that a good deal of work is still done in this way, especially at the smaller and the more remote stations.

Before the marvellous development of Aberdeen as a trawl-fishing centre, haddock curing in Scotland was engaged in chiefly with a view to the requirements of the Glasgow market. With the exception of those from some of the Firth of Forth ports, Scotch fishermen then seldom went to the English herring fishing in autumn. As soon as they completed their engagements at the Scotch East Coast herring fishing, they generally commenced the haddock fishing with small lines, at which they continued until after the New Year at least, but often well into the spring.

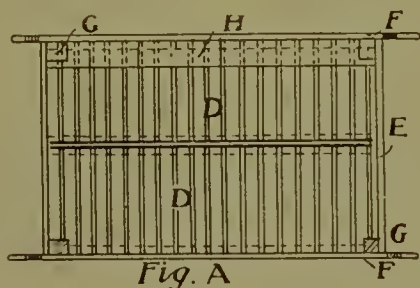
The fleet of small line boats was distributed round the whole coast, and, though as a rule the fleet at each creek was comparatively small, the quantity of fish landed and cured along the coast reached a considerable total. The bulk of those haddocks was cured for Glasgow, pale smoked. A much smaller proportion, generally of the smaller sized fish, was smoked a little harder and sent to Edinburgh.

The favour in which those line-caught fish were held was no doubt due to the fact that they were always landed fresh, and cured in good condition. Glasgow buyers got the credit of being both fastidious and discriminating, and the curer who could produce a uniformly good article could depend on getting the best market value for it.

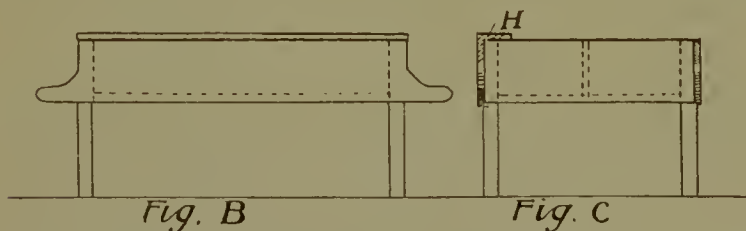
The curing was often done in premises that were also used for kippering herrings during the herring fishing season, and the plant provided was practically the same for both purposes. A large portable trough, however, in



which to put the fish for heading and gutting, is a very useful addition to the ordinary kipper-house plant. The accompanying sketches show the construction of such a



trough, 6 ft. long by 4 ft. wide, and with its top about 2 ft. 10 in. above the ground. In Fig. A the sides, ends, and division, all of inch planking, are shown at E and F. The four legs, 3 in. by 3 in., are marked G. The bottom is a grating made of 3 in. by  $\frac{3}{4}$  in. spars screwed on  $1\frac{1}{2}$  in. by 1 in. bearers, the spars being  $\frac{5}{8}$  in. apart. Fig. B shows



the side elevation, and Fig. C the end elevation. H (Figs. A and C) shows a 5 in. by 1 in. board for heading and opening, and it might be as well to have one of these at each side of the trough.

**HEADING AND GUTTING.**—The process of heading and gutting cod, having already been fully described, it will be sufficient now to say that the haddocks are emptied into one-half of this trough, where they are headed and gutted, the board along the side of the trough being of service during this operation. The black lining of the stomach, or as much of it as possible, should be removed at this stage; and livers, roes, and offal should be put into separate vessels.

The fish are now put into water and scrubbed outside and inside, then passed on to the splitter's bench.

**SPLITTING.**—The splitter lifts the haddocks one by one with his left hand, laying each fish in front of him with

its tail towards him. Taking a firm hold of the upper lug of the fish with his left hand, he enters the knife above the bone at the shoulder and draws it down to the root of the tail, keeping the blade close to the bone during the process, and taking care not to run the knife through the skin of the fish. If the splitting has been perfectly done, the fish is ready for the final washing. If the blood bone has not been cut through, the fish should be turned round, and as much of the bone chipped off with the point of the knife as will expose the blood cavity. If a ragged combing of bone has been left exposed along the edge of the back bone, the protruding ends of the bones should be removed by a sweep of the knife.

WASHING.—The fish are now ready for the final washing, which is usually done in the same vats or tubs in which the kippers are washed. In the case of haddocks, however, each fish has to be treated separately and scrubbed with a small brush. All marks of blood should be brushed off, especially from the blood bone; if there is any of the black lining of the stomach remaining, it should be carefully removed, and the outside of the fish should be brushed free from slime.

PICKLING.—After this washing the fish are ready for the pickle, which is made as described in Chapter IV. Instead, however, of emptying the haddocks at haphazard out of a basket into the pickle vat, it is better to lift them one by one and spread them out in the pickle, so that all the fish may be equally salted. Then, as the pickle is apt to be weakened by the immersion of so many fresh fish, it is advisable to throw a sprinkling of salt in between the tiers now and again as the vat is being filled, to help to keep the pickle up to the required strength. Half an hour is the usual time allowed in the pickle, but sometimes a little less or more, according to the size of the fish and the market for which they are being prepared.

HANGING.—After being drawn from the pickle, the haddocks are ready to be hung up in the smoke. Spits were formerly used to hang haddocks—wooden spits about as thick as a man's little finger, and long enough to stretch across the void of a kiln. When wooden spits were used, small sharp-pointed tin cones, known as spit pipes, were generally kept for fixing upon the ends of the spits and facilitating the process of hanging. The haddock was lifted in the left hand by the "lugs," partly folded, with the inside outwards; the spit was inserted under the lug bone at the soft side of the fish and run out at the same

place on the bone side. As many haddocks were put on as the spit would conveniently spread. Iron spits, about the thickness of an ordinary pencil, by and by took the place of the wooden ones, and these again are now being mostly replaced by tenters. When tenters are used, the haddocks are hung in exactly the same way as kippered herrings. (See Chapter VIII.)

SMOKING.—Oak chips and sawdust are used for smoking; and about two hours are usually sufficient to turn out pale-smoked haddocks for the Glasgow market. For Edinburgh a higher colour is required, and this may take from five to six hours.

A SMALL KILN.—Reference was made in Chapter IX. to the use of a small kiln for smoking bloaters or kippers, and Scotch fishermen's small haddock kilns were then mentioned. It is unnecessary to repeat what was said in that chapter, but it might be referred to by any small dealer who may wish for hints as to the curing of a few dozen haddocks.

PACKING.—Before packing, the fish should be allowed to cool, either in the kiln or on racks in the packing shed. Not very long ago, barrels were solely used for the Glasgow trade, the contents of the barrel representing  $2\frac{1}{4}$  cwt. to  $2\frac{1}{2}$  cwt. of live haddocks. In packing, the fish were laid upon their backs, the *bone* side of the haddock being kept to the side of the barrel. The barrels were hard filled and the ends pressed in, the fish of the top tier being turned back up. Nowadays the fish are almost all packed in boxes, with paper above and below them. For the commission market a 2-stone box is generally used; for customer trade the boxes range in capacity from 1 to 10 stones.

Although the Scotch trade alone has been here spoken of, the method of curing pale-smoked haddocks is practically the same all over. In large ports, such as Grimsby, however, time and labour-saving machinery has been utilised as much as possible. Some reference is made to the use of machinery in the next chapter, which treats of the curing of finnon haddocks.

## CHAPTER XXI.

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### TO CURE FINNON HADDOCKS.

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THIS special method of curing haddocks takes its name from the village of Findon, near Aberdeen. It was at first quite a home industry. Among the Kincardineshire villages the crews employed at the small line fishing usually divided each day's catch of haddocks as soon as they landed. Each fisherman then took his own share home, where the fish were cured by the female members of the family, the smoking being done in the kitchen chimney or "lum," which was specially adapted for the purpose.

Some of those fish were no doubt hawked through the surrounding country, but the city of Aberdeen was the principal market for them. The grocers bought the "finnon" haddocks wholesale from the fisherwomen, and, in addition to supplying their counter trade, they began to send supplies to shopkeepers in other towns. This may be said to have been the beginning of the enormous customer trade now done in Aberdeen. With the increase of orders, grocers and other dealers were induced to commence curing on their own account; and, on the other hand, with the influx of the village population to the city, some of the more enterprising fishermen gave up fishing and started business as wholesale fishcurers and merchants.

In the enlarged premises that were found necessary, machinery was soon introduced with a view to the saving of time and labour, but in all kilns intended for the smoking of "finnons" the idea of the "hanging lum" has been retained, no matter how large the kilns may be. The fish-houses need no special description. Their size, and the amount of plant necessary, depend upon the extent of the owner's business.

Finnons are now mostly made from trawl haddocks. The haddocks are brought from the market to the fish-house in the ordinary salesmen's trunks, which contain about 8 stones each. If they are "live" or ungutted fish, they have first to be headed and gutted, which may be done

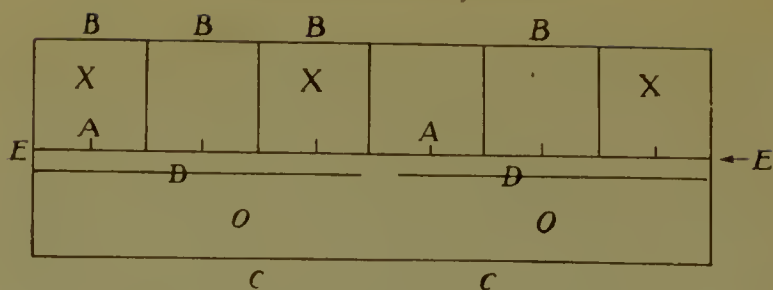
at a fish trough, as described in last chapter. If the fish have been gutted at sea, they have only to be headed now. In large establishments guillotines are a good deal used. These are heavy knives fastened with a hinge to a block at one end, and with a convenient handle at the free end. The operator raises the knife by the handle with his right hand, and with his left lays a haddock over the block with its throat up towards the knife. A downward movement of the right hand severs the head from the body. The head is thrown into the offal barrel; the body of the fish either drops into a basket or slides down a shoot, or might be conveyed by a moving belt to the washer. Before being washed, however, the black lining of the stomach should be removed.

WASHING.—In a modern haddock curing establishment the washing troughs are long vats divided into water-tight compartments about 2 ft. square. At the back of the washing trough there is a revolving shaft. In each compartment a brush is fixed upon the shaft in such a position that it revolves through the water that fills the troughs. A hood of zinc covers the brush sufficiently to keep the water from spraying over the place. A woman stands opposite each revolving brush. Lifting a haddock, she holds it to the brush, manipulating it so that all blood, black skin, and slime are thoroughly cleaned off.

SPLITTING.—The fish is then passed over the crank in front of the washer to a table on the opposite side, where the splitter stands. Funnons are split a little differently from Moray Firths. They are not split farther down than within an inch of the tail, and a cut is then made on the bone side of the fish. Entering the knife at the shoulder, the splitter makes a deep cut through the small bones to within an inch of the termination of the splitting. The object of this cut is to make the fish look broader. The haddocks as they are split are placed one by one upon a moving belt, two of which generally revolve from the centre outwards, towards opposite ends of the splitting table. The belt is usually so arranged that each haddock is deposited in a shoot, down which it slides into a receptacle at the end of the washing trough. Here a woman takes the fish in hand again and brings the blood bone lightly into contact with a revolving brush, to clean the blood cavity.

The sketch on page 98 represents a plan of a combined washing trough and splitting bench. The water-tight divisions of the trough are shown at X, the position of the revolving brushes is seen at A, and the washers stand at B. The



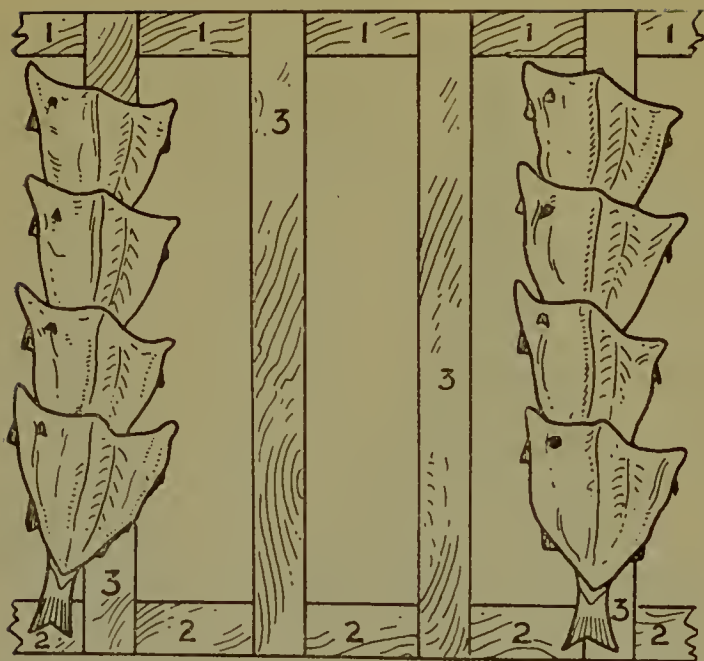


other half of the sketch represents the splitting table O, and C shows the position of the splitters, of whom there would be one for every two, or perhaps three, washers. The position of the moving belts is shown at D, and the position of the revolving shaft at E. Oil engines are generally used for driving the shaft and belts.

**PICKLING.**—After being split and washed the fish are ready for the pickle, which is made of the usual strength for herring curing. (See Chapter IV.) The time allowed in the pickle, for trawl haddocks, is from 20 minutes to half an hour, according to the size of the fish and the requirements of the market for which they are destined.

**DRYING AND HANGING.**—After they are drawn from the pickle the haddocks are laid upon "drippers" to "drouth," as it is termed in Aberdeen—*i.e.*, to be partially dried and put into shape before being spitted. The drying might be done in the open air under favourable weather conditions, but if the work of curing is to be carried on daily, in all weathers, a small drying shed is almost indispensable. If no existing building can be fitted up and ventilated for the purpose, the roof of a building might be extended so as to form a shed, with the sides wholly or partially open. The drippers might either be supported upon portable racks or standards such as are used to put tenters of kippers upon—(see Chapter VIII.)—or a fixed framework of bearers might be erected along the sides of the shed. The "drippers" are planks about 6 in. broad, and of a length to suit the drying shed—say, 10 ft. or 12 ft., more or less. These planks are bevelled, and when in use the rounded side is laid uppermost. The supports for the planks are shown in the sketch on page 99 at 1 and 2, and the planks upon which the split fish are laid out to dry are shown in position at 3. The fish are laid over the planks, or "drippers," as they are called, as shown, with their lugs overlapping, the second fish being laid so as to overlap the first, the third to overlap





the second, and so on. As a general rule, the haddocks are allowed to lie overnight upon the "drippers." In an emergency they may be spitted and hung right away; but, if so, there is more risk of fish falling off the spits during the process of smoking than when they are *drouthed* before being hung. Iron spits are used, and the spit is pierced through only one lug—the lug of the soft, or boneless, half of the fish. The position is shown by a dot on the fish in the above sketch. The full spits may be hung upon standards, or racks, until as many are ready as will fill a kiln. The latter may hold from 10 to 20 trunks of trawl haddocks. A trunk of trawl haddocks, after being cured, usually yields about  $5\frac{1}{2}$  stones of smoked fish.

**A FINNON KILN.**—The accompanying sketches show the construction of a finnon kiln. Fig. 1 shows the front view. The back wall, of brick, A, is shown in Fig. 2. The funnel B (Figs. 1 and 2) is of sheet iron, with a hollow revolving cone, or old wife's hood, with wind vane C on the top. The latter is most in favour with fishcurers. An "apron" of sheet iron or wood, D, slopes outwards from the lower front of the funnel. The floor E is of brick. About 2 ft. above the floor (Fig. 2) F, a row of bricks projects about 2 in. from the back wall of the kiln, and

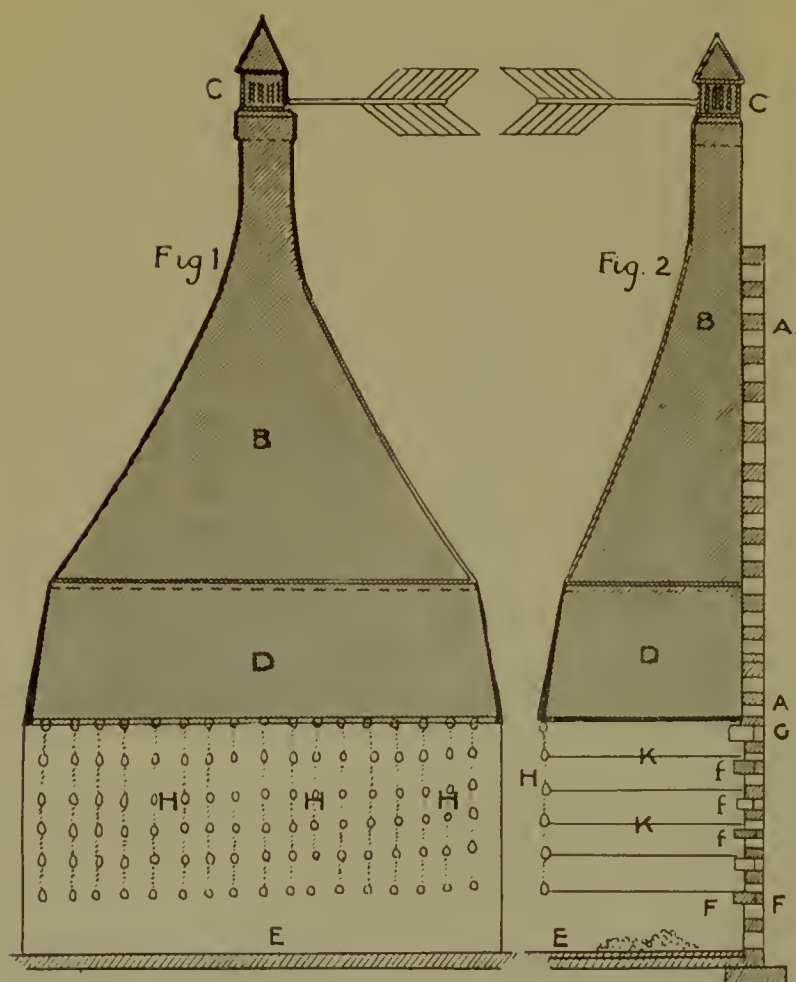
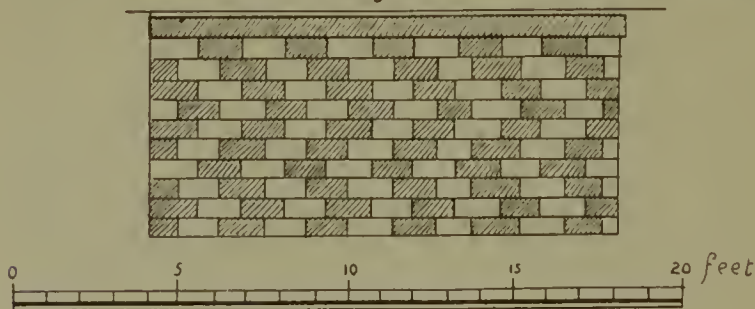


Fig 3



Scale.

five similar rows project at intervals of 1 ft. up to G at the level of the lower edge of the apron. In the older kilns stout cords with loops, and, in more modern kilns, chains with large links at intervals of 1 ft.—H—hang down from the front of the apron, the loops or large links being at a height corresponding to the rows of projecting bricks at the back. The chains might be hung at intervals of 6 in. to 9 in. apart. Between the chains H at the front and the projecting bricks F f at the back (see Fig. 2) there is a space equal to the length of a spit, say, 4 ft. Fig. 3 shows a brick hearth or floor bedded in concrete, 14 ft. by 6 ft. Including foundation for back wall, a building of this description might cost £45, more or less, according to the locality and cost of materials. Although a length of 14 ft. is given here for the front of the kiln, it should, of course, be understood that kilns vary in size according to the requirements of the curer and the ground space available.

Some recently constructed kilns are a compromise between the above and an ordinary Moray Firth kiln. The kiln is constructed like the void of an ordinary kipper kiln, with walls on both sides, and width enough for two lengths of spits. The kiln proper is, of course, much lower than a kipper kiln, and it is surmounted by the usual bottle-shaped funnel and cowl.

SMOKING.—The spits of fish are hung as shown at K, Fig 2. In order to impart the necessary high colour, peats and soft wood sawdust are used for smoking; and the time required is from six to eight hours. The smoking of finns is mostly done by women. At least one woman, but more often two, must attend the kiln constantly. The peat is broken up into small pieces, spread along the whole floor space below the fish, and ignited. When the fire gets too hot it has to be smothered with sawdust. Constant attention is required. Being hung near the fire, the fish must be closely watched lest they get scalded, in which case they would drop off the spits into the fire. If it is found that the fish are being smoked faster at one end of the spits than at the other, the spits must be turned end for end until they are all coloured alike.

SIZING AND PACKING.—When the fish are sufficiently smoked, the spits are taken from the kiln and hung across standards in the packing shed, where they are left until the haddocks are perfectly cool. They are then run off the spits upon benches, where they are “sized” and tied up in bunches of three by pieces of cord or grass passed

through the openings in the lug made by the spits. To take off any sawdust or ashes that may be adhering, the haddocks are then rinsed through weak pickle and brushed with a fine brush, after which they are ready for packing. Boxes only are used for the packing of finnows. A 2-stone box is the favourite size, but to suit the requirements of customers boxes ranging in capacity from 1 to 10 stones are generally kept in stock.

## CHAPTER XXII.

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### TO CURE SMOKIES OR CLOSE FISH.

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**GUTTING AND WASHING.**—The haddocks are headed, gutted, and washed in the usual way, but they are not split. On being washed they are laid upon a bench and sized, after which they are tied two and two together by the tails.

**PICKLING AND HANGING.**—They are then put into pickle for from one-half to three-quarters of an hour, or even an hour if the fish are large, the pickle taking longer time to penetrate the fish than if they were split. When sufficiently salted the fish are taken from the pickle, hung over rods, and laid out to "drip," which may be best done in a shed for drying fincons. The rods referred to are made of a length to suit the kiln, so that the fish do not have to be shifted when taken to the kiln to be smoked.

**THE KILN.**—The kiln may be constructed in either of two ways. One way is to sink a pit under the level of the ground, the sides and ends being built of brick. In this kiln billet-wood is used for fuel, the wood being chopped into small pieces. The other kiln is a brick tank built above the ground, with two or three ventilating holes near the ground. The walls might be about 4 ft. high. In this kiln white-wood chips are chiefly used for smoking.

The size of the kiln varies according to the curer's requirements. A fair average might be about a dozen feet long by 5 ft. to 6 ft. broad and 4 ft. high or deep. Some are larger, others considerably smaller.

**FIRES.**—In the underground pit the billet-wood must first be laid in position and lighted, and the fire must be clear before the fish are put in to smoke. In the other kiln the chips are put in first, then the fish are laid in position, and, finally, the fire lighted, a rod or two of fish being lifted to permit of this being done.

**COVERS.**—In either case the kiln must be closely covered, so that the smoke cannot escape. A flat wooden

frame is usually made to fit the kiln, and this frame is covered over with a heavy covering of bags or canvas.

SMOKING.—These kilns do not require much attention after the fires are lighted. Smoking is a very rapid process, and the fish are taken out practically cooked as well as smoked, after being exposed to the fire for perhaps three-quarters of an hour or little more.

PACKING.—The fish must be cooled after they are removed from the kiln. They are generally packed in small kipper boxes, containing a stone of fish each.



## CHAPTER XXIII.

### TO FILLET FISH.

ALTHOUGH the various details in the process of fish filleting are practically performed in the same way, they are sometimes done in different order by different curers. The following may, however, be taken as a fair description of this method of curing:—

HEADING, GUTTING, AND FINNING.—The fish are headed and gutted in the ordinary way, after which they should be washed through clean water. The fins are taken off in the following manner: Make an incision in the skin at the lower end of the dorsal fins, and run the knife up along each side of the fins along the back of the fish. The fins should then come away easily. The ventral and anal fins should be removed in the same way.

SPLITTING.—Split the fish carefully, so as not to leave any small bones on the fillets. It is best to enter the knife at the vent and run it down to the tail, then, reversing the blade so that the edge is uppermost, enter the knife at the vent again and move it forward so as to separate the rib bones from the fish. Turn the knife again, and, with the edge downwards, enter it at the shoulder of the fish and complete the splitting, separating the two halves of the fish at the same time. The bone should be taken from the other half of the fish in the same way. The lugs and the adjoining thin part of the fish should next be cut away, the part thrown away being thus a long, thin, triangular strip, with the lug bone as the base of the triangle.

SKINNING.—Lay a fillet on the bench, with the skin downwards. Take a firm hold of the tail with the left hand, and enter the knife between the skin and the flesh. Still holding the tail firmly with the left hand, run the knife forward close above the skin until the fish is separated and the fillet complete. Some curers skin and then fillet, but the man who first splits and then skins generally gets the best results, as his fish are firmer to handle, and there is thus less waste as a rule.

**DYEING AND PICKLING.**—Before being put into the pickle the fish fillets are generally coloured with Annatto dye. From a third to half a gallon of this dye might be allowed to a bucket of clean water, but there is no fixed rule. The quantity may be greater or less according to the curer's taste or the requirements of his customers. The fillets are merely dipped into the dye and immediately withdrawn. They are next put into clean *made* pickle (see Chapter IV.), in which they are left for half an hour or a little more, large fish usually getting rather longer in the pickle than small.

**DRYING AND SMOKING.**—After they are taken out of the pickle the fillets are hung up in the kiln and dried for from one to two hours, after which they are smoked for about the same time over a fire of hardwood chips and sawdust. Fish fillets are not tentered or spitted like other fish: they are either hung over tenter sticks without hooks or stretched across pairs of iron spits. In either case, very careful balancing and handling are required, otherwise the fillets are apt to fall off.

Cod and codlings, saith, and extra large haddocks are the fish generally preferred for filleting; small fish are unsuitable. Although the process looks, at first sight, rather elaborate and tedious, great skill and speed are acquired by practice, aided, no doubt, by division of labour. One expert skinner might keep four or five filleters and six or eight finners going, and for a full day's work a staff of this size might fillet from 500 to 600 stones of large cod or saith. This implies that the skinner must be able to skin a stone of fish per minute on an average; yet some men claim to be able to accomplish this.

Sheath knives, with blades about 5 in. long, are chiefly used for finning, and these knives are often used for filleting and skinning also, especially if the fish are medium sized. For large fish, however, longer knives are preferable for filleting and skinning.

## CHAPTER XXIV.

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### TO KIPPER SALMON.

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SOME time ago a subscriber to "The Fish Trades Gazette" wrote asking for instructions as to the kippering of salmon, with the stipulation that the cure must be sufficient to preserve the fish for a month or two, if required. As salmon curing is not in the writer's line, he has been obliged to apply to experts in this particular branch for the information desired.

**SCOTCH METHOD.**—The Scotch method of kippering salmon is simple enough: Wash and head the fish and split it down the back, removing the roe and intestines; then wash again to free it from blood stains, etc. Mix equal quantities of strong fishery salt and brown sugar; lay the fish in plenty of this mixture, and allow it to lie in it for forty-eight hours. The fish might be well rubbed with the preservative before being salted down in it. After forty-eight hours, hang the fish up, either in the open air and sun or in an ordinary kipper or finnon kiln. Three small double-pointed sticks should be fixed through the skin at intervals along the back of the fish, to keep it spread out during the process of drying. If dried in a kiln, a few hours' smoking is recommended. Some curers add a little saltpetre to the salt and sugar.

With a fish so rich and fatty as the salmon, it is plain that the above process can only be regarded as a temporary cure; and fish so treated will only keep for about the same time as kippered herrings or finnon haddocks.

**NORWEGIAN METHODS.**—To a Norwegian friend the writer is indebted for the following notes on the Norwegian methods of kippering salmon:—

*Mild Cure.*—Cut the head off, and split the fish down the back. Wash it clean, and then put it in salt or ordinary pickle. After lying in the pickle for three days, the fish is taken out and washed in clean, fresh water and then stretched upon pieces of lath. These pieces of lath are about an inch and a half broad, but quite thin. They

are cut to a length corresponding to the breadth of the fish, and sharpened at the ends. One of these spits is put across the back of the fish at the "lugs" or shoulders, another about half-way down, and, if the fish is very large, another still farther down, the points of the spits being stuck through the skin of the fish. The fish is then "tentured" and hung up in a chimney, where it is smoked over a fire of fir branches for a day and a half or two days. Salmon cured by this process come out something similar in appearance to an Aberdeen-cured haddock, but rather darker in the colour. They are cut into collops and sold for immediate use, generally at high prices.

*Hard Cure.*—Salmon meant to be kept for two or three months are much harder cured. In this case the fish are split into halves to facilitate the operation of curing, and to make them easier to handle and to stow in the barrels. These should be clean and tight, and preferably of hard wood. Although not insisted on, it would be advisable first to rub the fish well with a mixture of brown sugar and fishery salt, as in the Scotch method, and a little of the same mixture might be thrown in between the pieces of fish as they are packed into the cask. Hard packing should be avoided: sufficient room should be left to let the pickle circulate freely. The barrel should be filled quite full of strong, clean pickle (which in this case had better be filtered), the end put in and "tighted," and the barrel laid on its bilge. If properly cured, salmon treated in this way should keep for two or three months, or even longer if required. The barrel should, however, be opened occasionally and the fish examined. If there were any risk of the pickle turning stale, it should be poured off and fresh pickle substituted, the fish being well washed in clean pickle before being repacked. As a precautionary measure, the fish might be taken out, washed, and repacked after being two or three weeks in cure, even if there were no suspicion of staleness. When required, the pieces of fish should be taken out, well washed in clean, fresh water, and smoked in the same way as the milder-cured fish. Owing to the rich nature of the fish, this is the only method by which it seems possible to preserve salmon for any length of time apart from tinning. Dry-curing would fail to preserve such a fat fish. In Norway all the smoking is done in the chimneys of dwelling-houses, in much the same way as fimon haddock curing was originally done on the Kincardineshire coast.

# ERRATUM.

Please note that in 10th line " $16\frac{1}{3}$  gallons Imperial" should read " $13\frac{1}{3}$  gallons Imperial."

## CHAPTER XXV.

THE staves used in barrel making have to be of good, well-seasoned wood, which must be capable of retaining the pickle.

The staves and ends of barrels and half-barrels, when completed, must not be less than half an inch nor more than three-quarters of an inch thick, and they must not exceed six inches in breadth. Head ends must contain not less than three pieces and bottom ends not less than two pieces. The liquid capacity of a barrel is  $26\frac{2}{3}$  gallons, and of a half-barrel  $16\frac{1}{3}$  gallons Imperial. Diagonal rods of 23 in. and  $18\frac{1}{4}$  in. respectively are largely used in the measurement of barrels and half-barrels, but liquid measurement is the only strictly accurate test.

When Swedish spruce or other soft wood is used, the following are the usual sizes of staves:—

	Whole Barrels.	Half Barrels.	Firkins or Qrs.
Length ...	$31\frac{1}{8}$ in.	24 in.	18 in.
Thickness ...	$\frac{1}{16}$ "	$\frac{9}{16}$ "	$\frac{1}{2}$ "

The following are the usual sizes of trusses, the increase in size, to allow the hoops to pass, being 1 in. for barrels,  $\frac{3}{4}$  in. for half-barrels, and  $\frac{5}{8}$  in. for firkins.

	Barrels.	Half Barrels.	Firkins.
End Hoops ...	18 in.	$14\frac{3}{4}$ in.	$11\frac{1}{4}$ in.
Raising Hoops ...	19 "	$15\frac{1}{2}$ "	$11\frac{7}{8}$ "
Quarter Hoops ...	20 "	$16\frac{1}{4}$ "	$12\frac{1}{2}$ "
Bilge Hoops ...	21 "	17 "	$13\frac{1}{8}$ "

A cran measure has a capacity equal to  $37\frac{1}{2}$  Imperial gallons. The quarter-cran measure is a basket of the following dimensions:—

Interior diameter at bottom ...	...	$14\frac{1}{2}$ inches.
Interior diameter at mouth ...	...	$17\frac{1}{2}$ "
Diagonal measurement from inside the bottom to inner side of mouth ...	...	$21\frac{1}{2}$ "
Height inside ...	...	$14\frac{1}{2}$ "
Rise in bottom ...	...	$1\frac{1}{2}$ "

Basket measures must be officially stamped with the Crown brand before being used for the purchase or sale of herrings.

**Particulars for the information of candidates for the situation of fishery officer under the Fishery Board for Scotland.**

The limits of age are from 21 to 26 years.

Candidates, who must be of sound health and good character, have to furnish a certificate of their knowledge and skill in fishecuring and coopering, and an extract from the public register showing the date of their birth.

When a vacancy occurs in the Board's staff, candidates are allowed to compete in an examination on practical knowledge, after which one or more candidates are nominated by the Board for examination by the Civil Service Commissioners. The subjects of examination are:—

1. Handwriting.
2. Arithmetic (including vulgar and decimal fractions, averages, percentages, long and cross tots).
3. English composition, including spelling.
4. Geography, with special reference to countries engaged in the herring trade.
5. Digesting returns into summaries.

Candidates have to qualify in the five subjects, and the order of merit is finally determined by the total number of marks obtained in both examinations.

Form of certificate (to be written by the candidate) to be lodged by persons wishing to be appointed fishery officers:—

We do hereby certify that.....has exercised the trade of a cooper, and has been employed in the curing and packing of herrings, and that, in our opinion, he is skilful therein, and qualified to overlook the curing of herrings, and to judge whether they are properly pined, cured, and packed so as to be entitled to the official brand, according to the directions of an Act passed in the forty-eighth year of the reign of His Majesty George III., cap. 110, for the farther encouragement and better regulation of the white



herring fishery; also, that, from his education and practice in business, he is qualified to take and keep a regular distinct account of salt, nets, barrels, and other stores shipped or put on board vessels or boats for the herring fishery, and of such articles or of the different kinds of fish landed from vessels or boats on their return from the fishing; to administer declarations with due solemnity, to conduct correspondence respecting the business of any fishery district to which he may be appointed, and generally to execute the duties which will be required of him as an officer of the fishery under the provisions of the various Sea Fisheries Acts.

We do further certify that the said.....is a man of good character.

[Date.]

[Signatures and Professions or Designations.]







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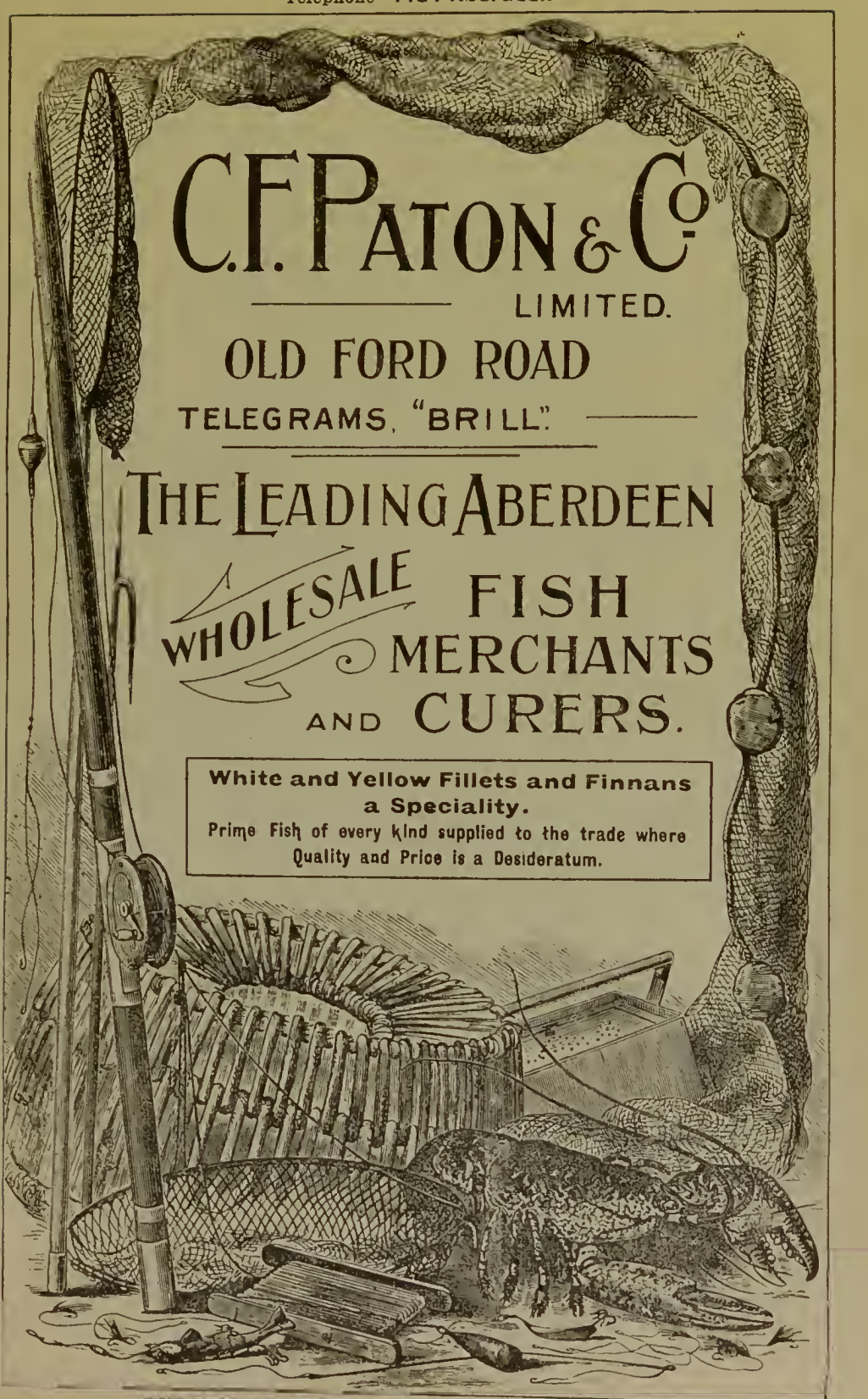
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**Monday and Thursday Evenings, 6 to 8.**

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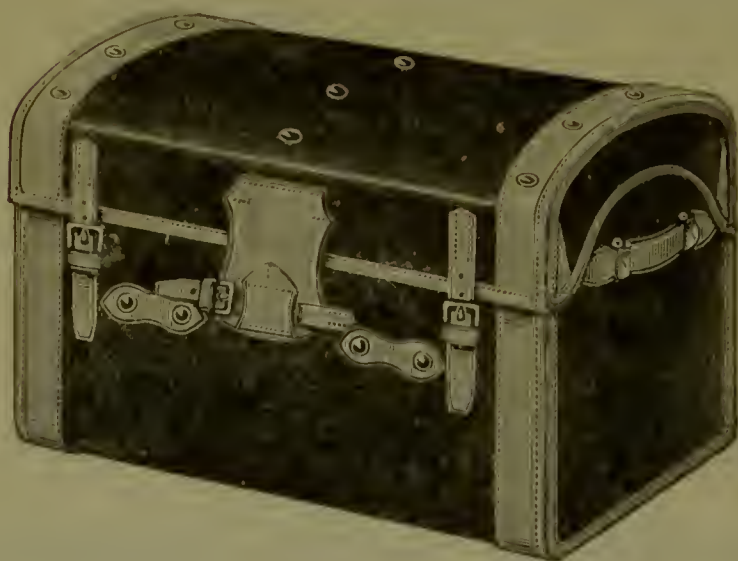
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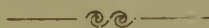


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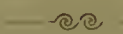
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